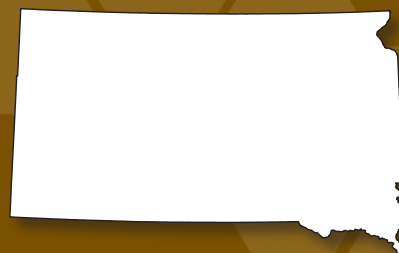


South Dakota's Forests, 2010: Statistics, Methods, and Quality Assurance



Forest Inventory Methods

Strategic Model

The Forest Inventory and Analysis program of the Northern Research Station (NRS-FIA) is part of the national enhanced FIA program that focuses on a set of six strategic objectives (McRoberts 2005):

- A standard set of variables with nationally consistent meanings and measurements
- Field inventories of all forested lands
- Nationally consistent estimation
- Adherence to national precision standards
- Consistent reporting and data distribution
- Credibility with users and stakeholders

To ensure that these six strategic objectives are achieved, 10 strategic approaches have been prescribed:

- A national set of prescribed core variables with a national field manual that prescribes measurement procedures and protocols for each variable
- A nationally consistent plot configuration
- A nationally consistent sampling design
- Estimation using standardized formulas for sample-based estimators
- A national database of FIA data with core standards and user-friendly public access
- A national information management system
- A nationally consistent set of tables of estimates of prescribed core variables
- Publication of statewide tables with estimates of prescribed core variables at 5-year intervals
- Documentation of the technical aspects of the FIA program including procedures, protocols, and techniques
- Peer review and publication of the technical documentation for general access

The result of the strategic objectives and approaches is an inventory program with identifiably new features and a nationally consistent plot configuration, a nationally consistent sampling design for all lands, annual measurement of a proportion of plots in each state, nationally consistent estimation techniques and algorithms, and integration of the ground sampling components of the FIA inventory and the detection monitoring by the U.S. Forest Service's Forest Health Monitoring (FHM) program.

Forest Inventory

Historically, NRS-FIA (formerly the North Central Research Station FIA program) in St. Paul, MN and the Interior West FIA (IWFIA) (formerly the Intermountain FIA program) in Ogden, UT inventoried South Dakota's forest resources. NRS-FIA inventoried that portion of the State east of the 103rd meridian. IWFIA inventoried western South Dakota (west of the 103rd meridian), including the Black Hills National Forest (BHNF). In 1996, NRS-FIA inventoried all of South Dakota except for the BHNF (Leatherberry et al. 2000), which was inventoried by IWFIA in 1999 (DeBlander 2002). The portion of the Custer National Forest that is in South Dakota was inventoried again by IWFIA in 1997 (DeBlander 2001). Since the 1996/1999 inventory, several changes in FIA methods have improved the quality of the inventory. The most significant change between inventories has been the shift from periodic to annual inventory. In the past, FIA inventoried each state on a cycle that averaged 12 years. However, the need for timely and consistent data across large geographical regions, along with national legislative mandates, resulted in FIA implementing an annual inventory program. Annual inventory was initiated in South Dakota in 2001.

With the NRS-FIA annual inventory system, approximately one-fifth of all field plots are measured each year. The entire inventory is completed within 5 years. After this initial 5-year period, NRS-FIA will report and analyze results using a moving 5-year average. For example, NRS-FIA generated inventory results for

South Dakota for 2001 through 2005 and for 2006 through 2010.

Other significant changes between inventories include implementing new remote-sensing technology, a new field-plot configuration and sample design, and gathering additional remotely sensed and field data. The new remote-sensing technology allows NRS-FIA to use classifications of Multi-Resolution Land Characterization (MRLC) data and other remote-sensing products to stratify the total area of South Dakota and to improve estimates.

New algorithms were used for the 2010 inventory to assign forest type and stand-size class to each condition observed on a plot. These algorithms are being used nationwide by FIA to provide consistency from state to state. As a result, changes in forest type and stand-size class will reflect actual changes in the forest and not changes due to differences between algorithms. The list of recognized forest types, groupings of these forest types for reporting purposes, models used to assign stocking values to individual trees, definition of nonstocked (stands with a stocking value of less than 10 percent for live trees), and names given to the forest types changed with the new algorithms. Consequently, comparisons between the published 2010 results and those published for earlier inventories may be invalid. Contact NRS-FIA for additional information on the algorithms used in both inventories.

Plot Configuration

The national FIA plot design consists of four 24-foot-radius subplots configured as a central subplot and three peripheral subplots (Fig. 62). Centers of the peripheral subplots are located at distances of 120 feet from the central subplot at azimuths of 0°, 120°, and 240° from the center of the central subplot. Each tree with a diameter at breast height (d.b.h.) of 5 inches or greater is measured on these subplots. Each subplot contains a 6.8-foot-radius microplot with center located 12 feet east of the subplot center on which each tree with d.b.h. between 1 and 5 inches is measured. Forest conditions

that occur on any of the four subplots are identified and recorded. If the area of the condition is 1 acre or greater, the condition is mapped on the subplot. Factors that differentiate forest conditions include forest type, stand-size class, stand origin, land use, ownership, and density.

Sample Design

Historic sampling errors indicate that a sampling intensity of about one plot per 6,000 acres is required to satisfy national FIA precision guidelines. Therefore, FIA divided the area of the United States into nonoverlapping, 5,937-acre hexagons and established a plot in each hexagon as follows: (1) if an existing FIA plot from the 1999 inventory in the Black Hills National Forest was located in a hexagon, it was selected; (2) if no FIA plot from the previous periodic inventory was located in the hexagon, a new FIA plot was established at a random location in the hexagon (Brand et al. 2000, McRoberts 1999). This array of field plots is designated the Federal base sample and is considered an equal probability sample; its measurement is funded by the Federal Government.

The Federal base sample was systematically divided into five interpenetrating, nonoverlapping panels or subsamples, each of which provides complete,

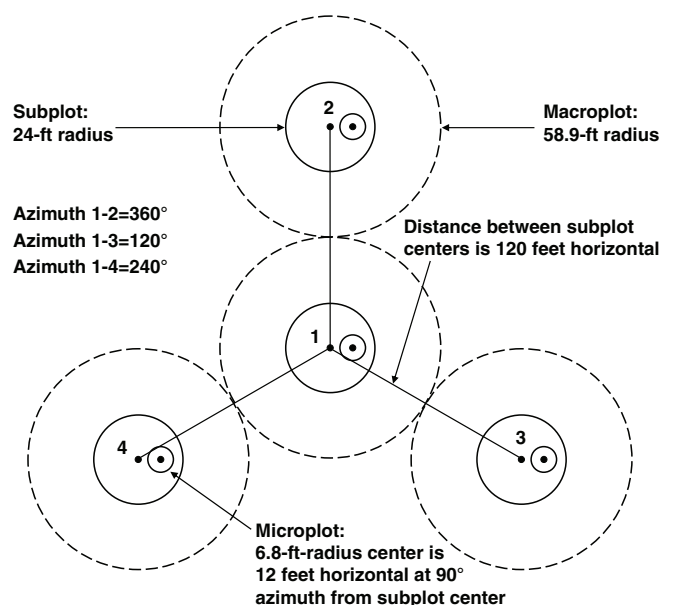


Figure 71.—FIA plot design (adapted from Bechtold and Patterson 2005).

systematic coverage of a state. Each year, the plots in a single panel are measured, and panels are selected on a 5-year, rotating basis (McRoberts 1999). For estimation purposes, the measurement of each panel of plots is considered an independent, equal probability sample of all lands in a state.

Three-phase Inventory

FIA conducts inventories in three phases. Phase 1 (P1) uses remotely sensed data to obtain initial plot land cover observations and to stratify land area in the population of interest to increase the precision of estimates. In Phase 2 (P2), field crews visit the physical locations of permanent field plots to measure traditional inventory variables such as tree species, diameter, and height. In Phase 3 (P3), field crews visit a subset of P2 plots to obtain measurements for an additional suite of variables associated with forest and ecosystem health. The three phases of the enhanced FIA program are discussed in greater detail in the following sections.

Phase 1

Aerial photographs, digital orthoquads (DOQs: digitally scanned aerial photographs), and satellite imagery are used for initial plot measurement via remotely sensed data and stratification. P1 plot measurement consists of observations of conditions at the plot locations using aerial photographs or DOQs. Analysts determine a digitized geographic location for each field plot, and a human interpreter assigns the plot a land cover/use. Lands satisfying FIA's definition of forest land include commercial timberland, some pastured land with trees, forest plantations, unproductive forested land, and reserved, noncommercial forested land. In addition, forest land requires minimum stocking levels, a 1-acre minimum area, and a minimum bole-to-bole width of 120 feet with continuous canopy. Forest land excludes wooded strips, idle farmland with trees, and narrow windbreaks. All plot locations that could possibly contain accessible forest land are selected for further measurement during P2.

The combination of natural variability among plots and budgetary constraints prohibits measurement of a sufficient number of plots to satisfy national precision standards for most inventory variables unless the estimation process is enhanced using ancillary data. Thus, the land area is stratified by using remotely sensed data to facilitate stratified estimation. NRS-FIA uses canopy density classes to derive strata. Canopy density information was obtained from the 2001 National Land Cover Database (NLCD). The NLCD 2001 canopy density layer for the United States was produced through a cooperative project conducted by the Multi-Resolution Land Characteristics (MRLC) Consortium (<http://www.mrlc.gov/>). The layer characterizes subtle variations of forest canopy density as a percentage estimate of forest canopy cover (0 to 100) within every 30-m pixel over the United States. The method employed to map canopy density for NLCD 2001 is described in detail in Huang et al. (2001).

The current strata categorization was optimized for the entire NRS-FIA region. Using plot location information (center of the center subplot), we assigned a percent canopy density value to each plot. Plots were then aggregated into one of the five strata based on the center of the center subplot. The percent canopy cover stratification scheme consists of five groupings: (1) 0 to 5 percent, (2) 6 to 50 percent, (3) 51 to 65 percent, (4) 66 to 80 percent, and (5) 81 to 100 percent. These groupings were based on observed natural clumping of pixel values. If there were not enough plots in each of these classes to create strata, then collapsing rules were used to combine classes until sufficient sample sizes were obtained.

In addition to being classified into one of the five canopy strata, each pixel was assigned to an ownership stratum. In South Dakota, ownership layers derived from the Protected Areas Database (PAD—<http://www.protectedlands.net/>) and U.S. Census Bureau TIGER data (<http://www.census.gov/geo/www/tiger/>) were used to classify pixels into three ownership classes: (1) inland census water, (2) public, and (3) private. Every pixel was also assigned to a county based on pixel center location.

Stratified estimation requires two tasks. First, each plot must be assigned to a single stratum. Next, the proportion of each detailed stratum must be calculated (TM land-cover classification, ownership, and river basin area (county groups) delineation). The first task is done by assigning each plot to the stratum assigned to the pixel containing the center of the center subplot. The second task is done by calculating the proportion of pixels in each stratum. The population estimate for a variable is calculated as the sum across all strata of the product of each stratum's observed proportion (from P1) and the variable's estimated mean per unit area for the stratum (from P2).

Phase 2

In P2, field crews record a variety of data for plot locations determined in P1 to include accessible forest land. Before visiting plot locations, field crews consult county land records to determine the ownership of plots and then seek permission from private landowners to measure plots on their lands. Field crews determine the location of the geographic center of the center subplot using geographic positioning system (GPS) receivers. They record subplot-level observations that include land cover, forest type, stand origin, stand age, stand-size class, site productivity class, forest disturbance history, slope, aspect, physiographic class, and ground land use conditions. For each tree, field crews record a variety of observations and measurements including species, live/dead status, lean, diameter, height, crown ratio (percent of tree height represented by crown), crown class (e.g., dominant, co-dominant, suppressed), damage, and decay status. Office staff use statistical models based on field crew measurements to calculate values for additional variables including individual tree volume, per unit area estimates of number of trees, volume, and biomass by subplot, by species groups, and by live/dead status.

Phase 3

The third phase of the enhanced FIA program focuses on forest health. P3 is administered cooperatively by the FIA program, other Forest Service programs, other

Federal agencies, State natural resource agencies, and universities, and it is partially integrated with the Forest Health Monitoring (FHM) program. The FHM program consists of four interrelated and complementary activities: detection monitoring, evaluation monitoring, intensive site ecosystem monitoring, and research on monitoring techniques. Detection monitoring consists of systematic aerial and ground surveys designed to collect baseline information on the current condition of forest ecosystems and to detect changes from those baselines over time. Evaluation monitoring studies examine the extent, severity, and probable causes of changes in forest health identified through the detection monitoring surveys. The intensive site ecosystem monitoring program conducts research into regionally specific ecological processes at a network of sites located in representative forested ecosystems. Finally, research on monitoring techniques focuses on developing and refining indicator measurements to improve the efficiency and reliability of data collection and analysis at all levels of the program.

The ground survey portion of the FHM detection monitoring program was integrated into the FIA program as P3 in 1999. The P3 sample consists of a one sixteenth subset of the P2 plots with one P3 plot for approximately every 96,000 acres. P3 measurements are obtained by field crews during the growing season and include an extended suite of ecological data: lichen diversity and abundance, soil quality (erosion, compaction, and chemistry), vegetation diversity and structure, and down woody material. The incidence and severity of ozone injury for selected bioindicator species also are monitored as part of an associated sampling scheme. Because each P3 plot is also a P2 plot, all P2 measurements are made on each P3 plot at the same time as the P3 measurements.

P3 variables were selected to address specific criteria outlined by the Montreal Process working group (Montreal Process 1995) for the conservation and sustainable management of temperate and boreal forests and are based on the concept of indicator variables. Observations of an indicator variable represent an index of ecosystem functions that can be monitored over

time to assess trends. Indicator variables are used in conjunction with each other, P2 data, data from FHM evaluation monitoring studies, and ancillary data to address ecological issues such as vegetation diversity, fuel loading, regional air quality gradients, and carbon storage. The P2 and P3 data of the enhanced FIA program serve as the Nation's environmental report card and are a primary source of reporting data for the Montreal Process Criteria and Indicators (for more information, see Woodall et al. 2011).

Estimation

Most of the estimates and analysis presented in this report (including all the estimate tables) are based on averages observed on 8,301 plots located across South Dakota. These plots are located within 23 unique strata (Table A) defined by combinations of the five P1 canopy cover classes: (1) 0 to 5 percent, (2) 6 to 50 percent, (3) 51 to 65 percent, (4) 66 to 80 percent, and (5) 81 to 100 percent, a land ownership classification created from the Protected Areas Database, and river basin areas. Nationally consistent algorithms were used to assign forest type and stand-size class to each condition observed on a plot. For NRS-FIA, panels are measured on an annual basis so that five panel estimates are equivalent to 5-year moving average estimates. Field plot measurements are combined with P1 estimates in the compilation process and table production. Procedures described in Bechtold and Patterson (2005) for stratified estimation with observed stratum areas were used in conjunction with the strata presented in Table A to produce all estimates. Table A shows the total area and number of plots within each stratum.

Integration with Previous Inventories

In 2010, NRS-FIA completed measurement of the fifth panel of inventory plots in South Dakota. The 2010 panel along with those surveyed in 2006, 2007, 2008, and 2009 make up the dataset for the sixth full inventory of South Dakota's forests. For simplicity, the sixth inventory often is called the 2010 inventory of South Dakota. Data from new inventories are often compared with data from earlier inventories to determine trends in forest resources. However, for the comparisons to be valid, the procedures used in the two inventories must be similar.

To improve the efficiency and reliability of the inventory, several changes in procedures and definitions have been made since the last South Dakota inventory in 2005 (Piva et al. 2009). Although these changes will have little impact on statewide estimates of forest area, timber volume, and tree biomass, they may significantly impact plot classification variables such as forest type and stand-size class. For estimating growth, removals, and mortality, the 2005 inventory (Piva et al. 2009) was processed using estimation/summary routines for the 2010 inventory. Although these changes allow limited comparison of inventory estimates among separate inventories in this report, it is inappropriate to directly compare all portions of the 2006-2010 data with those published for earlier inventories.

For further information about the sample protocols and estimation procedures for the first two phases of the FIA program, see Bechtold and Patterson (2005). For more information on P3 indicator sampling protocols, see USDA Forest Service (2007) and Woodall and Monleon (2008).

Quality of the Estimates

The four primary sources of error common to all sample-based estimates are sampling, measurement, prediction, and nonresponse error. For each of these sources of error, a definition within the context of the FIA inventory is provided along with a discussion of methods used to quantify and reduce this error.

Sampling Error

The process of sampling (selecting a random subset of a population and calculating estimates from this subset) causes estimates to contain error they would not have if every member of the population had been observed and included in the estimate. The 2010 FIA inventory of South Dakota is based on a sample of 8,301 plots located randomly across the State (a total area of 49,353,880 acres), a sampling rate of about one plot for every 5,946 acres.

The procedures for statistical estimation outlined in the previous section and described in detail in Bechtold and Patterson (2005) provide the estimates of the population totals and means presented in this report. Along with every estimate is an associated sampling error that is typically expressed as a percentage of the estimated value but that can also be expressed in the same units as the estimate or as a confidence interval (the estimated value plus or minus the sampling error). This sampling error is the primary measure of the reliability of an estimate. A sampling error can be interpreted to mean that had a 100-percent inventory been taken using these methods, the chances are two out of three that the results would have been within the limits indicated (i.e., 68-percent confidence interval).

The sampling errors for State-level estimates of the major attributes presented in this report are shown in Table B. Table SD-65 presents sampling errors for these estimates at the inventory unit and river basin area levels.

Estimates for classifications smaller than the State totals presented in Table B will have larger sampling errors. For

example, Table SD-65 shows that the sampling error for timberland area in any river basin area is higher than that for total timberland area in the State. To compute an approximate sampling error for an estimate that is smaller than a State total, use the following formula:

$$E = \frac{(SE) \sqrt{(\text{State total estimate})}}{\sqrt{(\text{Smaller estimate})}} \quad (1)$$

where:

E = approximate sampling error for smaller estimate

SE = sampling error for State total estimate

For example, to compute the error on the area of National Forest System forest land in the State, proceed as follows:

The total National Forest System forest land area in the State from Table SD-2 is estimated at 1,017,700 acres.

The total area of all forest land in the State from Table SD-2 is 1,883,000 acres.

The State total error for forest land area from Table B is 2.87 percent.

Using formula (1):

$$\text{Sampling Error} = \frac{(2.86) \sqrt{(1,883,000)}}{\sqrt{(1,017,700)}} = 3.90 \text{ percent.}$$

This approximation works well for estimates of area, volume, number of trees, and biomass. It is less effective for estimates of growth, removals, or mortality. Individuals seeking more accurate sampling errors should use Forest Inventory Data Online (FIDO), available at <http://fiatools.fs.fed.us>.

The estimators used by FIA are unbiased under the assumptions that the sample plots are a random sample of the total population and the observed value for any plot is the true value for that plot. Deviations from these basic assumptions are not reflected in the computation of sampling errors. The following sections on measurement,

prediction, and nonresponse error address possible departures from these basic assumptions.

Measurement Error

Errors associated with the methods and instruments used to observe and record the sample attributes are called measurement errors. On FIA plots, attributes such as the diameter and height of a tree are measured with different instruments, and other attributes such as species and crown class are observed without the aid of an instrument. On a typical FIA plot, 30 to 70 trees are observed with 15 to 20 attributes recorded on each tree. In addition, many attributes that describe the plot and conditions on the plot are observed. Errors in any of these observations affect the quality of the estimates. If a measurement is biased (such as tree diameter consistently taken at an incorrect place on the tree), then the estimates that use this observation (such as volume) will reflect this bias. Even if measurements are unbiased, high levels of random error in the measurements will add to the total random error of the estimation process.

To ensure that all FIA observations are made to the highest standards possible, a regular program of quality assurance and quality control is an integral part of all FIA data collection efforts. This program begins with the documentation of protocols and procedures used in the inventory followed by intensive crew training. To assess the quality of the data collected by these trained crews, a random sample of at least 4 percent of all plots are measured independently by a different expert crew. These independent measurements are referred to as blind checks. The purpose of these blind checks is to assess the quality of field measurements. The second measurement on these blind check plots is done by a Quality Assurance (QA) crew. In all cases, QA crews have as much or more experience and training in FIA field measurements than standard FIA crews.

The quality of field measurements is assessed nationally through a set of measurement quality objectives (MQOs) that are set for every data item we collect. Each MQO consists of two parts: a tolerance or acceptable level of

measurement error, and an objective in terms of the percent of measurements within tolerance. The blind check measurements are used to observe how often individual field crews are meeting these objectives and to assess the overall compliance among all crews. Table C shows the compliance rates for various measurements used to compute the estimates included in this report and in other NRS-FIA reports. The columns labeled South Dakota come from blind check measurements of plots used in this report, and the columns labeled All NRS- FIA States come from all measurements made by FIA crews within the entire 24-state area where the Northern Research Station implemented the FIA program over 2006-2010. Training and supervision of crews is a regional effort and crews often work in more than one state. Regional data quality observations reflect the overall measurement quality of all data collected by FIA in the NRS region.

In addition to the percent compliance to measurement quality objectives, the blind check observations were used to test for relative bias in the field crew measurements. Relative bias is defined here as a tendency for the standard field crew measurements to be higher or lower than those measurements taken by the QA crews. The estimated relative bias and limits of 95-percent confidence intervals (based on parametric bootstrap estimates) for the relative bias are presented in Table D.

The blind check measurements do not provide direct observations of true bias in field measurements (average difference between field measurements and true values) because they are paired observations of two field measurements. The QA crew in these blind checks typically has more training and experience with FIA field measurements than the first crew, but both crews use the same methods and instruments to obtain the measurements. These methods were the best available and were selected for use nationwide by FIA; they are commonly used by other similar natural resource inventories. A basic assumption is that the methods, when correctly applied, provide unbiased observations of the attribute they are designed to measure. Under this assumption, relative bias observations in Table D provide

observations of bias due to the difference in experience and training between the field and QA crews. In most cases there is no significant bias.

Prediction Error

Errors associated with using mathematical models (such as volume models) to provide observations of the attributes of interest based on sample attributes are referred to as prediction errors. Area, number of trees, volume, biomass, growth, removals, and mortality are the primary attributes of interest presented in this report. Area and number of trees estimates are based on direct observation and do not involve the use of prediction models; however, FIA estimates of volume, biomass, growth, removals, and mortality use model-based predictions in the estimation process. Models are used to predict volume and biomass estimates of individual tree volumes. Change estimates such as growth, mortality, and removals are based on these model-based predictions of volume from both the current plot measurements and the measurements taken in the previous inventory.

In comparing FIA estimates to other data sources, users need to be aware of the prediction models used in both estimates. If both estimates are based on the same prediction models with matching fitted parameter values, then the prediction bias of one estimate should cancel out that of the other estimate. If the estimates are based on different prediction models, then the user should be aware of the prediction error of both models.

Nonresponse Error

Nonresponse error refers to the error caused by not being able to observe some of the elements in the sample. In FIA, nonresponse occurs when crews are unable to measure a plot (or a portion of a plot) at a selected location. Nonresponse falls into the following three classes:

Denied access – Entire plots or portions of plots where the field crew is unable to obtain permission from the landowner and is therefore unable to measure the trees on the plot.

Hazardous/inaccessible – Entire plots or portions of plots where the conditions present prevent a crew from safely getting to the plot or measuring the trees on the plot.

Other – Plots where the field crew is unable to obtain a valid measurement for a variety of reasons other than those stated above.

Nonresponse has two effects on the sample. First, it reduces the sample size. The reduced sample size is reflected in the sampling errors discussed in that section. Second, nonresponse can bias the estimates if the portion of the population not being sampled differs from the portion being sampled. In FIA, unlike many survey samples, nonresponse rates are relatively low. In the 2010 South Dakota inventory, 8,301 sample plots were selected to be observed. Of the total sample plots selected for observation, 8,275 are in the sample used for the estimation of current resources. There were 20 plots where crews were unable to obtain owner permission to measure the plot and 10 plots where hazardous conditions prevented the crew from measuring all or part of the plot. No plots were lost from the sample due to additional problems.

Even though an overall response rate of 99.7 percent is very high, it can cause considerable bias if not properly accounted for. The major source of nonresponse is denied access to plots. Denied access plots primarily occur on lands in private ownership. Also, the observations needed for plots on nonforest and water land classes do not usually require crews to physically enter the land and permission is not needed to obtain the observation because it can be obtained from aerial photos or other remotely sensed information sources.

The stratified estimation process used by FIA with strata defined by three ownership classes (inland census water, public, and private) and five canopy cover classes reduces the possible effects of bias caused by nonresponse. Under the stratified estimation process used by FIA, nonresponses are removed from the sample, and stratum estimates (means, totals, and sampling

errors) are obtained from only those plots with valid observations. The net effect in the estimates of means and totals is that the average of the observed plots within the stratum (ownership class-forest cover class) becomes the estimate for all nonresponses within that stratum. The nonresponse rate in one stratum does not affect the estimate in other strata. The response rate within each stratum is presented in Table E for the South Dakota 2010 inventory and for all FIA inventories conducted by the Northern Research Station over the same period.

The nonresponse plots in this inventory were not permanently removed from the FIA system of plots. In future inventories, we will again attempt to measure these plots. At that time we may be able to obtain permission to access these plots, the hazardous conditions may have changed, or other circumstances that caused us to drop plots from a specific inventory cycle will probably be different.

Glossary

Accretion: The estimated net growth on trees that were measured during the previous inventory (divided by the number of growing seasons between surveys to produce average annual accretion). It does not include growth on trees cut during the period or those trees that died. This component uses the incremental change in volume between two inventories.

Average annual mortality of growing stock: The average annual change in cubic-foot volume of sound wood in growing-stock trees that died over a defined measurement cycle.

Average annual mortality of sawtimber: The average annual change in board-foot volume of sound wood in sawtimber trees that died over a defined measurement cycle.

Average annual net growth of growing stock: The average annual change in cubic-foot volume of sound wood in live growing-stock trees, and the total volume of trees entering diameter classes greater than 5.0 inches d.b.h., through ingrowth, less volume losses resulting from natural causes. Natural causes include mortality except that due to logging damage, timber stand improvement, or conversion to a nonforest land use.

Average annual net growth of sawtimber: The average annual change in the board-foot volume of live sawtimber trees, and the total volume of trees reaching sawtimber size, less volume losses resulting from natural causes. Natural causes include mortality except that due to logging damage, timber stand improvement, or conversion to a nonforest land use.

Average annual removals from growing stock: The average cubic-foot volume of wood in live growing-stock trees removed annually for roundwood forest products, in addition to the volume in logging residues or mortality due to logging damage (harvest removals). This component of change also includes the volumes

of growing-stock trees removed due to land use changes (other removals).

Average annual removals from sawtimber: The average board-foot volume of wood in live sawtimber trees removed annually for roundwood forest products, in addition to the volume of logging residues or mortality due to logging damage (harvest removals). This component of change also includes the volumes of sawtimber trees removed due to land use changes (other removals).

Basal area: Tree area in square feet of the cross section at breast height of a single tree. When the basal areas of all trees in a stand are summed, the result is usually expressed as square feet of basal area per acre.

Bioindicator species: A tree, woody shrub, or nonwoody herb species that responds to ambient levels of ozone pollution with distinct visible foliar symptoms that is easy to diagnose.

Board foot: A unit of lumber measuring 1-foot long, 1-foot wide, and 1-inch thick, or its equivalent. International 1/4-inch rule is used as the U.S. Forest Service standard log rule in the eastern United States.

Bulk density: The mass of soil per unit of volume. A measure of the ratio of pore space to solid materials in a given soil. It is expressed in units of grams per cubic centimeter of oven-dry soil.

Census water: Lakes, reservoirs, ponds, and similar bodies of water 4.5 acres in size or larger; and rivers or canals more than 200 feet wide (U.S. Census definition).

Coarse woody debris (CWD): Dead branches, twigs, and wood splinters 3.0 inches in diameter and larger measured at the smallest end.

Commercial species: Tree species currently or prospectively suitable for industrial wood products; excludes species of typically small size, poor form, or inferior quality, e.g., hawthorn and sumac.

Compacted live crown ratio: The percent of the total length of the tree that supports a full, live crown. To determine compacted live crown ratio for trees that have uneven length crowns, lower branches are visually transferred to fill holes in the upper portions of the crown, until a full, even crown is created.

Condition: A delineation of a land area based upon land use, forest type, stand size, regeneration status, reserved status, tree density, and owner class.

Corporate: An ownership class of private lands owned by corporations.

County and municipal: A class of public lands owned by counties or local public agencies, or lands leased by these governmental units for more than 50 years.

Cropland: Land under cultivation within the last 24 months, including cropland harvested, crop failures, cultivated summer fallow, idle cropland used only for pasture, orchards, active Christmas tree plantations indicated by annual shearing, nurseries, and land in soil improvement crops, but excluding land cultivated in developing improved pasture.

Crown: The part of a tree or woody plant bearing live branches or foliage.

Crown dieback: Recent mortality of branches with fine twigs, which begins at the terminal portion of a branch and proceeds toward the trunk. Dieback is considered only when it occurs in the upper and outer portions of the tree. When whole branches are dead in the upper crown, without obvious signs of damage such as breaks or animal injury, it is assumed the branches died from the terminal portion of the branch. Dead branches in the lower portion of the live crown are assumed to have died from competition and shading.

Cull decrement: The net volume of rough and rotten cull trees in the previous inventory that are classified as growing-stock trees in the current inventory (divided by the number of growing seasons between inventories to compute average annual cull decrement).

Cull increment: The net volume of growing-stock trees in the previous inventory that are classified as rough and rotten cull trees in the current inventory (divided by the number of growing seasons between inventories to compute average annual cull increment).

Cull tree: A live tree, 5.0 inches in d.b.h. or larger, that is unmerchantable for saw logs now or prospectively because of rot, roughness, or species. (See definitions for rotten and rough trees.)

Decay class: Qualitative assessment of stage of decay (five classes) of coarse woody debris based on visual assessments of color of wood, presence/absence of twigs and branches, texture of rotten portions, and structural integrity.

Diameter at breast height (d.b.h.): The diameter outside bark of a standing tree measured 4.5 feet above the ground.

Diameter at root collar (d.r.c.): The diameter outside bark of a bole measured at the root collar of a shrub or tree. Also called basal diameter.

Diameter class: A classification of trees based on diameter outside bark measured at breast height (4.5 feet above ground). With 2-inch diameter classes, the 6-inch class, for example, includes trees 5.0 through 6.9 inches diameter at breast height (d.b.h.).

Dry ton: A unit of measure of dry weight equivalent to 2,000 pounds or 907.1848 Kg.

Dry weight: The weight of wood and bark as it would be if it had been oven dried; usually expressed in pounds or tons.

Down woody material (DWM): Woody pieces of trees and shrubs that have been uprooted (no longer supporting growth) or severed from their root system, not self-supporting, and lying on the ground.

Duff: A soil layer dominated by organic material derived from the decomposition of plant and animal litter and deposited on either an organic or a mineral surface. This layer is distinguished from the litter layer in that the original organic material has undergone sufficient decomposition that the source of this material (e.g., individual plant parts) can no longer be identified.

Effective cation exchange capacity (ECEC): The sum of cations that a soil can adsorb in its natural pH. Expressed in units of centimoles of positive charge per kilogram of soil.

Federal: An ownership class of public lands owned by the U.S. Government.

Fiber products: Products derived from wood and bark residues, such as pulp, composition board products, and wood chips.

Fine materials: Wood residues not suitable for chipping, such as planer shavings and sawdust.

Fine woody debris (FWD): Dead branches, twigs, and wood splinters 0.1 to 2.9 inches in diameter.

Forest industry: An ownership class of private lands owned by companies or individuals operating wood-using plants.

Forest land: Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forest land includes transition zones, such as areas between heavily forested and nonforested lands that are at least 10 percent stocked with forest trees and forest areas adjacent to urban and builtup lands. Also included are pinyon-juniper and chaparral areas in the West and afforested areas. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of trees must have a crown width of at least 120 feet to qualify as forest land. Unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 feet wide.

Forest type: A classification of forest land based on the species presently forming a plurality of the live-tree stocking.

South Dakota forest types:

Red pine: Associates—eastern white pine, jack pine, red maple, northern red oak, white spruce, balsam fir, quaking aspen, bigtooth aspen, paper birch, northern pin oak. Sites—common on sandy soils, but reaches best development on well-drained sandy loam to loam soils. Softwood forest type and member of the white/red/jack pine forest-type group.

White spruce: Associates—black spruce, paper birch, quaking aspen, red spruce, balsam fir, and balsam poplar. Sites—transcontinental; grows well on calcareous and well-drained soils, but is found on acidic rocky and sandy sites, and sometimes in fen peatlands along the marine coast. Softwood forest type and member of the spruce/fir forest-type group.

Eastern redcedar: Associates—gray birch, red maple, sweet birch, Virginia Pine, shortleaf pine, oak. Sites—usually dry uplands and abandoned fields on limestone outcrops and other shallow soils but can grow well on good sites. Softwood forest type and member of the other eastern softwoods group forest-type group.

Rocky Mountain juniper: Forests in which rocky mountain juniper comprises a plurality of the stocking. Softwood forest type and member of the pinyon/juniper forest-type group.

Ponderosa pine: Associates—Douglas-fir, lodgepole pine, grand fir, Jeffrey pine, western larch, quaking aspen, Utah juniper, Gambel oak. Sites—this forest type is distributed over vast areas in the West and therefore can have great differences in environmental conditions. Softwood forest type and member of the ponderosa pine forest-type group.

Bur oak: Associates—northern pin oak, black oak, chinkapin oak, and eastern redcedar in northern and

dry upland sites; shagbark hickory, black walnut, eastern cottonwood, white ash, American elm, swamp white oak, honey locust, and American basswood in southern and lowland sites. Sites—drier uplands to moist bottomlands with the drier uplands more common in the northern part of the range and the moist bottomlands more common in the southern part of the range. Hardwood forest type and member of the oak/hickory forest-type group.

Elm/ash/black locust: Associates—Black locust, silver maple, boxelder, blackbead ebony, American elm, slippery elm, rock elm, red maple, green ash predominate. Found in North Central region, unknown in the Northeast. Sites—upland. Hardwood forest type and member of the oak/hickory forest-type group.

Mixed upland hardwoods: Includes Ohio buckeye, yellow buckeye, Texas buckeye, red buckeye, painted buckeye, American hornbeam, American chestnut, eastern redbud, flowering dogwood, hawthorn spp., cockspur hawthorn, downy hawthorn, Washington hawthorn, fleshy hawthorn, dwarf hawthorn, honeylocust, Kentucky coffeetree, Osage-orange, all mulberries, blackgum, sourwood, southern red oak, shingle oak, laurel oak, water oak, live oak, willow oak, black locust, blackbead ebony, anacahuita, and September elm. Associates—Any mixture of hardwoods of species typical of the upland central hardwood region should include at least some oak. Sites—wide variety of upland sites. Hardwood forest type and member of the oak/hickory forest-type group.

Cottonwood: Associates—willow, white ash, green ash, and sycamore. Sites—streambanks where bare, moist soil is available. Hardwood forest type and member of the elm/ash/cottonwood forest-type group.

Sugarberry/hackberry/elm/green ash: Associates—boxelder, pecan, blackgum, persimmon, honeylocust, red maple, and hackberry. Sites—low ridges and flats in flood plains. Hardwood forest type and member of the elm/ash/cottonwood forest-type group.

Cottonwood/willow: Associates—white ash, green ash, sycamore, American elm, red maple and boxelder. Sites—stream banks where bare, moist soil is available. Hardwood forest type and member of the elm/ash/cottonwood forest-type group.

Sugar maple/beech/yellow birch: Associates—butternut, basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, sweet birch, American elm, rock elm, and eastern hophornbeam. Sites—fertile, moist, well-drained sites. Hardwood forest type and member of the maple/beech/birch forest-type group.

Aspen: Associates—Engelmann spruce, lodgepole pine, ponderosa pine, Douglas-fir, subalpine fir, white fir, white spruce, balsam poplar, and paper birch. Sites—aspen has the capacity to grow on a variety of sites and soils, ranging from shallow stony soils and loamy sands to heavy clays. Hardwood forest type and member of the aspen/birch forest-type group.

Paper birch: Associates—aspen, white spruce, black spruce, and lodgepole pine. Sites—can be found on a range of soils, but best developed on well-drained sandy loam and silt loam soils. Hardwood forest type and member of the aspen forest-type group.

Other hardwoods: Includes other native hardwood species and species groupings that do not fit into a forest type above. Hardwood forest type and member of the other hardwoods forest-type group.

Other exotic hardwoods: Includes any of the following species: Norway maple, ailanthus, mimosa, European alder, Chinese chestnut, ginkgo, Lombardy poplar, European mountain-ash, West Indian mahogany, Siberian elm, saltcedar spp., chinaberry, Chinese tallowtree, tung-oil-tree, Russian-olive, and avocado. Hardwood forest type and member of the exotic hardwoods forest-type group.

Forest-type group: A combination of forest types that share closely associated species or site requirements and are generally combined for brevity of reporting.

Gross growth: The sum of accretion and ingrowth.

Growing stock: A classification of timber inventory that includes live trees of commercial species meeting specified standards of quality or vigor. Cull trees are excluded. When associated with volume, this includes only trees 5.0 inches d.b.h. and larger.

Growing-stock volume: Net or gross volume in cubic feet of growing-stock trees 5.0 inches and larger d.b.h. measured from the 1-foot stump to a minimum 4.0-inch top diameter outside bark on the central stem, or to the point where the central stem splits into limbs. Net volume equals gross volume minus deduction for cull defects.

Hardwood: A dicotyledonous tree, usually broad-leaved and deciduous.

Soft hardwoods: A category of hardwood species with wood generally of low specific gravity (less than 0.5). Notable examples include red maple, paper birch, quaking aspen, and American elm.

Hard hardwoods: A category of hardwood species with wood generally of high specific gravity (greater than 0.5). Notable examples include sugar maple, yellow birch, black walnut, and oaks.

Industrial wood: All commercial roundwood products except fuelwood.

Ingrowth: The estimated net volume of trees that became 5.0 inches and larger d.b.h. during the period between inventories (divided by the number of growing seasons between surveys to produce average annual ingrowth). Also, the estimated net volume of trees 5.0 inches and larger d.b.h. that are growing on land that was reclassified from noncommercial forest land or nonforest land to timberland.

Introduction: The intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity. “Introduced” is

not synonymous and should not be confused with the term “invasive” (USDA definition).

Invasive species: Those species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health. For the purpose of this policy only, a plant species is considered “invasive” only when it occurs on the Federal or State-specific noxious weed list or a list developed by the State-specific Department of Agriculture with their partners and approved by the State Technical Committee that prohibits or cautions its use due to invasive qualities (USDA definition).

Land area: The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 200 feet wide; and lakes, reservoirs, and ponds less than 4.5 acres in area.

Land use: A classification of land that indicates the primary use at the time of the inventory. Major categories are forest land and nonforest land.

Litter: Undecomposed or only partially decomposed organic material that can be readily identified (e.g., plant leaves, twigs).

Live aboveground biomass: The aboveground volume of live trees (including bark but excluding foliage) reported in dry tons (dry weight). Biomass has four components:

Bole: Biomass of a tree from 1 foot above the ground to a 4-inch top outside bark or to a point where the central stem breaks into limbs.

Tops and limbs: Total biomass of a tree from a 1-foot stump minus the bole.

Saplings: Total aboveground biomass of a tree from 1.0 to 4.9 inches d.b.h.

Stump: Biomass of a tree 5 inches d.b.h. and larger from the ground to a height of 1 foot.

Live cull: A classification that includes live, cull trees. When associated with volume, it is the net volume in live, cull trees that are 5.0 inches d.b.h. and larger.

Logging residues: The unused portions of growing-stock and nongrowing-stock trees cut or killed by logging and left in the woods.

Merchantable: Refers to a pulpwood or saw log section that meets pulpwood or saw log specifications, respectively.

National Forest: An ownership class of Federal lands, designated by Executive order or statute as National Forests or purchase units, and other lands under the administration of the Forest Service including experimental areas.

Net cubic-foot volume: The gross volume in cubic feet less deductions for rot, roughness, and poor form. Volume is computed for the central stem from a 1-foot stump to a minimum 4.0-inch top diameter outside bark, or to the point where the central stem breaks into limbs.

Net board-foot volume: The gross volume in board feet less the deductions for rot, roughness, and poor form. Volume is computed from the 1-foot stump to a minimum 7.0-inch diameter outside bark for softwoods and a minimum 9.0-inch outside bark for hardwoods on the central stem. This estimate includes all softwoods 9.0 inches d.b.h. and larger, and all hardwoods 11.0 inches d.b.h. and larger.

Noncensus water: Streams/ivers 120 to 200 feet wide and bodies of water 1 to 4.5 acres in size, where the U.S. Bureau of the Census (1990) classifies such water as land.

Noncommercial species: Tree species of typically small size, poor form, or inferior quality, which normally do not develop into trees suitable for industrial wood products.

Nonforest land: Land that has never supported forests and lands formerly forested where use of timber management is precluded by development for other uses. (Note: Includes area used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, powerline clearings of any width, and 1- to 4.5-acre areas of water classified by the U.S. Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and clearings, etc., must be more than 1 acre in area to qualify as nonforest land.)

Nonindustrial private: An ownership class of private lands where the owner does not operate wood-using plants.

Nonnative species: Within a particular ecosystem, any species (including its seeds, eggs, spores, or other biological material capable of propagating that species;) that is not native to that ecosystem (USDA definition).

Nonstocked areas: Timberland less than 10 percent stocked with all live trees.

Ownership unit: A classification of ownership encompassing all types of legal entities having an ownership interest in land, regardless of the number of people involved. A unit may be an individual; a combination of persons; a legal entity such as a corporation, partnership, club, or trust; or a public agency. An ownership unit has control of a parcel or group of parcels of land.

Owner class: A classification of land into categories of ownership.

Forest industry: Land owned by private companies that operate primary wood-using mills.

Nonindustrial private: Land owned by other corporate, individuals, or trusts (NGOs) that do not operate primary wood-using mills.

Other corporate: Land owned by timber investment or real estate companies.

Public: Land owned by federal, state, county, or municipal government.

Ozone: A regional, gaseous air pollutant produced primarily through sunlight-driven chemical reactions of nitrogen dioxide and hydrocarbons in the atmosphere and causing foliar injury to deciduous trees, conifers, shrubs, and herbaceous species.

Ozone bioindicator site: An open area used for ozone injury evaluations on ozone-sensitive species. The area must meet certain site selection guidelines on size, condition, and plant counts to be used for ozone injury evaluations in FIA.

Physiographic class: A measure of soil and water conditions that affect tree growth on a site. The physiographic classes are:

Xeric: Very dry soils where excessive drainage seriously limits both growth and species occurrence. These sites are usually on upland and upper half slopes.

Xeromesic: Moderately dry soils where excessive drainage limits growth and species occurrence to some extent. These sites are usually on the lower half slopes.

Mesic: Deep, well-drained soils. Growth and species occurrence are limited only by climate. These include all cove sites and bottomlands along intermittent streams.

Hydromesic: Moderately wet soils where insufficient drainage or infrequent flooding limits growth and species occurrence to some extent.

Hydric: Very wet sites where excess water seriously limits both growth and species occurrence.

Poletimber trees: Live trees at least 5.0 inches d.b.h. but smaller than sawtimber trees.

Primary wood-using mill: A mill that converts roundwood products into other wood products. Common examples are sawmills that convert saw logs into lumber and pulp mills that convert pulpwood into paper.

Productivity class: A classification of forest land in terms of potential annual cubic-foot volume growth per acre at culmination of mean annual increment in fully stocked natural stands.

Pulpwood: Roundwood, whole-tree chips, or wood residues used for the production of wood pulp.

Reserved forest land: Forest land withdrawn from timber utilization through statute, administrative regulation, or designation without regard to productive status. Examples include national forest wilderness areas, national parks, and national monuments.

Residues: Bark and woody materials that are generated in primary wood-using mills when roundwood products are converted to other products. Examples are slabs, edgings, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and pulp screenings. Includes bark residues and wood residues (both coarse and fine materials) but excludes logging residues.

Rotten tree: A live tree of commercial species that does not contain a saw log now or prospectively primarily because of rot (that is, when rot accounts for more than 50 percent of the total cull volume).

Rough tree: (a) A live tree of commercial species that does not contain a saw log now or prospectively primarily because of roughness (that is, when sound cull due to such factors as poor form, splits, or cracks accounts for more than 50 percent of the total cull volume); or (b) a live tree of noncommercial species.

Roundwood products: Logs, bolts, and other round timber generated from harvesting trees for industrial or consumer use. Roundwood products include saw logs, veneer, cooperage logs, bolts, pulpwood logs, fuelwood, pilings, poles posts, ties, mine timbers, and various other round or split products.

Salvable dead tree: A downed or standing dead tree considered currently or potentially merchantable by regional standards.

Saplings: Live trees 1.0 inch through 4.9 inches d.b.h.

Saw log: A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark of 6 inches for softwoods and 8 inches for hardwoods, or meeting other combinations of size and defect specified by regional standards.

Sawtimber tree: A live tree of commercial species containing at least a 12-foot saw log or two noncontiguous saw logs 8 feet or longer, and meeting regional specifications for freedom from defect. Softwoods must be at least 9.0 inches d.b.h. Hardwoods must be at least 11.0 inches diameter outside bark (d.o.b.).

Sawtimber volume: Net or gross volume in board-foot (International 1/4-inch rule) or cubic-foot of the saw log portion of live sawtimber trees measured from the 1-foot stump to a minimum 7.0-inch top diameter outside bark (for softwoods) or a 9.0-inch top diameter outside bark (for hardwoods), on the central stem, or to the point where the central stem splits into smaller limbs. Net volume equals gross volume minus deduction for rough and rotten cull.

Seedling: Live tree smaller than 1.0 inch d.b.h./d.r.c. and at least 6.0 inches in height for softwoods and 12.0 inches in height for hardwoods.

Site index: An expression of forest site quality based on the height of a free-growing dominant or codominant tree of a representative species in the forest type at age 50.

Snag: A standing dead tree. In the current inventory, a snag must be 5.0 inches d.b.h./d.r.c. and 4.5 feet tall, and have a lean angle less than 45 degrees from vertical. A snag may be either self-supported by its roots or supported by another tree or snag.

Softwood: A coniferous tree, usually evergreen, having needles or scale-like leaves.

Sound dead: The net volume in salvable dead trees.

Species group: A combination of tree species that share closely associated understory plants or site requirements.

Stand: A group of trees on a minimum of 1 acre of forest land that is stocked by forest trees of any size.

Standing dead tree: A standing dead tree must be at least 5 inches d.b.h. or larger, at least 4.5 feet in height, and have a lean of less than 45 degrees from the vertical. A snag should be self-supported or supported by another tree.

Stand-size class: A classification of forest land based on the size class of live trees in the area. The classes include:

Nonstocked: Forest land stocked with less than 10 percent of full stocking with live trees. Examples are recently cutover areas or recently reverted agricultural fields.

Sapling-seedling: Forest land stocked with at least 10 percent of full stocking with live trees with half or more of such stocking in seedlings or saplings or both.

Poletimber: Forest land stocked with at least 10 percent of full stocking with live trees with half or more of such stocking in poletimber or sawtimber trees or both, and in which the stocking of poletimber exceeds that of sawtimber.

Sawtimber: Forest land stocked with at least 10 percent of full stocking with live trees with half or more of such stocking in poletimber or sawtimber trees or both, and in which the stocking of sawtimber is at least equal to that of poletimber.

State: An ownership class of public lands owned by states or lands leased by states for more than 50 years.

Stocking: The degree of occupancy of land by trees, measured by basal area or number of trees by size and spacing, or both, compared to a stocking standard; that is, the basal area or number of trees, or both, required to fully utilize the growth potential of the land.

Stocking class: At the tree level, stocking is the density expressed as a percent of total tree density required to fully utilize the growth potential of the land. At the stand level it is expressed as the sum of the stocking values of all trees sampled. The classes include:

Overstocked: Forest stand with stocking ≥ 100 percent.

Fully stocked: Forest stand that contains 60 to 99 percent of full stocking.

Moderately stocked: Forest stand that contains 35 to 59 percent of full stocking.

Poorly stocked: Forest stand that contains only 10 to 34 percent of full stocking.

Nonstocked: Forest stand with less than 10 percent of full stocking.

Timberland: Forest land that is producing or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation. (Note: Areas qualifying as timberland are capable of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands. Currently inaccessible and inoperable areas are included.)

Timber products output: All timber products cut from roundwood and byproducts of wood manufacturing plants. Roundwood products include logs, bolts, or other round sections cut from growing-stock trees, cull trees, salvable dead trees, trees on nonforest land, noncommercial species, sapling-size trees, and limbwood. Byproducts from primary manufacturing plants include slabs, edging, trimmings, miscuts, sawdust, shavings, veneer cores and clippings, and screenings of pulpmills that are used as pulpwood chips or other products.

Tree: A woody plant usually having one or more erect perennial stems, a stem diameter at breast height of at least 3 inches, a more or less definitely formed crown of foliage, and a height of at least 15 feet at maturity.

Tree class: A classification of tree quality or condition of the tree for saw log production. Tree class for sawtimber-size trees is based on current conditions. Tree class for poletimber-size trees is based on the prospected determination or forecast of the potential tree quality when the tree reaches sawtimber size.

Tree size class: A classification of trees based on diameter at breast height, including sawtimber trees, poletimber trees, saplings, and seedlings.

Tops: The wood of a tree above the merchantable height (or above the point on the stem 4.0 inches diameter outside bark (d.o.b.) or to the point where the central stem breaks into limbs). It includes the usable material in the uppermost stem.

Total live tree biomass: The total mass of live trees and associated saplings expressed in pounds or tons (dry weight) per unit area. The total tree and sapling biomass (excluding foliage) has five components:

Bole: Biomass of a tree from 1 foot above the ground to a 4-inch top outside bark or to a point where the central stem splits into smaller limbs. This includes protruding twigs from the central stem.

Tops and limbs: Total biomass of a tree from the 12-inch stump minus the bole. This does not include any twigs protruding from the central stem below the 4-inch top.

Sapling trees: Total biomass of a tree from 1 to 4.9 inches diameter measured at the root collar d.b.h. or d.r.c.

Stump: Total biomass of a tree 5 inches d.b.h. and larger from the ground to a height of 1 foot.

Belowground: Total biomass of the belowground portion of the stump and the coarse roots of all trees and saplings.

Urban forest land: Land that would otherwise meet the criteria for timberland but is in an urban-suburban area surrounded by commercial, industrial, or residential development and not likely to be managed for the production of industrial wood products on a continuing basis. Wood removed would be for land clearing, fuelwood, or esthetic purposes. Such forest land may be associated with industrial, commercial, residential subdivision, industrial parks, golf course perimeters, airport buffer strips, and public urban parks that qualify as forest land.

Unreserved forest land: Forest land not withdrawn from harvest by statute or administrative regulation. Includes forest lands that are not capable of producing in excess of 20 cubic feet per acre per year of industrial wood in natural stands.

Veneer log: A roundwood product from which veneer is sliced or sawn and that usually meets certain standards of minimum diameter and length and maximum defect.

Weight: The weight of wood and bark, oven-dry basis (approximately 12 percent moisture content).

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Table SD-58.—Area of timberland, in thousand acres, by inventory unit, river basin area, and stocking class, South Dakota, 2010

Table SD-59.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-59a.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (Scribner rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-60.—Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-60a.—Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber, in million board feet (Scribner rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-61.—Average annual removals of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-61a.—Average annual removals of growing-stock trees (at least 5 inches d.b.h.) in million board feet, and sawtimber trees, in million board feet (Scribner rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Table SD-65.—Sampling errors, in percent, for net volume, average annual net growth, average annual removals, and average annual mortality on timberland, and forest and timberland area by inventory unit and river basin area, South Dakota, 2010

*All tables contain forest attribute estimates for South Dakota for measurements taken from 2006 to 2010, except where indicated.

**Gaps in enumeration of tables are placeholders for future tables such as forest health indicator population estimates (e.g., down woody material).

Table A.—Area and number of plots in each stratum used for stratification and estimation, South Dakota, 2010

Unit code ^a	Estimation unit description ^b	Canopy cover stratum ^c	Acres	Selected ^d	Office selected ^e	Field selected ^f	Field sampled ^g	Total plot sampled for change ⁱ	Field plots sampled for change ^j	Not measured ^k
1	Buffalo Gap NGL Unit 1	Canopy cover 0 - 80	106,000	20	20	0	0	20	0	0
1	Dakota Prairie NGL	Canopy cover 0 - 80	154,000	25	25	0	0	25	0	0
1	Fort Pierre NGL	Canopy cover 0 - 65	115,000	20	20	0	0	20	0	0
1	Inland Census Water Unit 1	Canopy cover 0 - 100	751,000	144	143	1	1	144	1	0
1	Private Unit 1	Canopy cover 0 - 5	35,448,000	5,969	5,888	81	76	5,967	79	5
1	Private Unit 1	Canopy cover 6 - 50	454,000	62	26	36	34	61	35	2
1	Private Unit 1	Canopy cover 51 - 65	111,000	16	3	13	13	15	12	0
1	Private Unit 1	Canopy cover 66 - 100	107,000	14	3	11	8	14	11	3
1	Public Unit 1	Canopy cover 0 - 100	962,000	154	149	5	5	154	5	0
2	Black Hills NF	Canopy cover 0 - 5	183,000	32	9	23	23	32	23	0
2	Black Hills NF	Canopy cover 6 - 50	325,000	57	1	56	56	57	56	0
2	Black Hills NF	Canopy cover 51 - 65	163,000	27	0	27	27	27	27	0
2	Black Hills NF	Canopy cover 66 - 80	169,000	33	0	33	33	33	33	0
2	Black Hills NF	Canopy cover 81 - 100	232,000	38	0	38	38	38	38	0
2	Buffalo Gap NGL Unit 2	Canopy cover 0 - 100	483,000	72	72	0	0	72	0	0
2	Custer NF	Canopy cover 0 - 100	74,000	13	9	4	4	13	4	0
2	Inland Census Water Unit 2	Canopy cover 0 - 100	38,000	10	10	0	0	10	0	0
2	Private Unit 2	Canopy cover 0 - 5	7,911,000	1,327	1,306	21	19	1,325	19	2
2	Private Unit 2	Canopy cover 6 - 50	425,000	81	38	43	38	75	37	5
2	Private Unit 2	Canopy cover 51 - 65	73,000	16	0	16	12	13	13	4
2	Private Unit 2	Canopy cover 66 - 100	94,000	16	0	16	16	16	16	0
2	Public Unit 2	Canopy cover 0 - 5	888,000	136	130	6	5	136	6	1
2	Public Unit 2	Canopy cover 6 - 100	90,000	19	2	17	15	18	16	2

(Table A continued on next page)

Table A.—Footnote

^aCounties in Unit 1 include: Aurora, Beadle, Bennett, Bon Homme, Brookings, Brown, Brule, Buffalo, Campbell, Charles Mix, Clark, Clay, Codington, Corson, Davison, Day, Deuel, Dewey, Douglas, Edmunds, Faulk, Grant, Gregory, Haakon, Hamlin, Hand, Hanson, Hughes, Hutchinson, Hyde, Jackson, Jerauld, Jones, Kingsbury, Lake, Lincoln, Lyman, Marshall, McCook, McPherson, Melleette, Miner, Minnehaha, Moody, Perkins, Potter, Roberts, Sanborn, Spink, Stanley, Sully, Todd, Tripp, Turner, Union, Union, Walworth, Yankton, Ziebach. Counties in Unit 2 include: Butte, Custer, Fall River, Harding, Lawrence, Meade, Pennington, Shannon.

^bEstimation unit description: Description of the sub-population undergoing post-stratification.

^cCanopy cover stratum: A stratum within each estimation unit defined by partitioning the full range of percent canopy (0 - 100%) into 5 strata.

^dSelected: The number of plots selected when the sample was drawn.

^eOffice selected: The number of plots determined to have no chance of being forested during a prefield interpretation procedure. These plots are withheld from field sampling and considered remotely sampled.

^fField selected: The number of plots determined to have some chance of being forested, or that were forested or non-sampled on a previous visit.

^gField sampled: The number of field selected plots that were successfully sampled in the field.

^hField sampled forested: The number of field selected plots that were successfully sampled in the field and found to intersect forest land.

ⁱTotal plots sampled for change: The number of plots included in the sample that were successfully sampled in the previous cycle.

^jField sampled plots for change: The number of plots included in the sample that were successfully sampled in the previous cycle and that were sent to the field for sampling.

^kNot measured: The number of plots that were selected as part of the sample, but were completely non-sampled.

Table B.—State-level estimates of major forest resource attributes and their sampling errors, South Dakota, 2010

Item	State total	Sampling error
Growing stock on timberland		
Volume	<i>million cubic feet</i>	<i>percent</i>
	1,958.3	4.91
Average annual net growth	38.2	23.14
Average annual removals	25.5	22.16
Average annual mortality	22.8	18.65
Sawtimber on timberland	<i>million board feet^a</i>	
Volume	6,900.9	6.32
Average annual net growth	193.2	18.25
Average annual removals	84.6	25.69
Average annual mortality	64.4	19.49
Area	<i>thousand acres</i>	
Forest land	1,883.0	2.87
Timberland	1,764.6	3.01
Biomass (aboveground live trees and saplings)	<i>million dry tons</i>	
Forest land	45.3	4.19
Timberland	43.0	4.38

^aInternational ¼-inch rule.

Table C.—Compliance to measurement quality objectives (MQO) tolerances of variables based on blind check plots, South Dakota, 2010

Variable	Tolerance	Objective (%)	South Dakota		All NRS States	
			% of data within tolerance	Observations	% of data within tolerance	Observations
Plot Level						
National Variables						
Distance to Road	No Tolerance	90.0	74.1	27	82.3	2,010
Water on Plot	No Tolerance	90.0	96.3	27	85.7	2,010
Regional Variables						
Elevation	±50 feet	99.0	82.8	29	88.0	1,886
Latitude - decimal degrees	±0.0001 degree	99.0	100.0	29	100.0	1,888
Longitude - decimal degrees	±0.0001 degree	99.0	79.3	29	89.1	1,888
Latitude - distance	±140 feet		.	.	.	.
Longitude - distance	±140 feet		.	.	.	.
Number of plots				31		2,114
Condition Level						
National Variables						
Condition Status	No Tolerance	99.0	98.8	160	98.9	4,732
Reserve Status	No Tolerance	99.0	100.0	160	99.7	4,732
Owner Group	No Tolerance	99.0	96.3	27	97.8	2,348
Forest Type (Type)	No Tolerance	95.0	92.6	27	86.4	2,348
Forest Type (Group)	No Tolerance	99.0	100.0	27	92.5	2,348
Stand Size	No Tolerance	99.0	100.0	27	89.4	2,348
Regeneration Status	No Tolerance	99.0	96.3	27	98.0	2,348
Tree Density	No Tolerance	99.0	100.0	27	96.8	2,348
Owner Class	No Tolerance	99.0	96.3	27	94.3	2,348
Owner Status	No Tolerance	99.0	100.0	27	97.4	2,348
Regeneration Species	No Tolerance	99.0	96.3	27	98.1	2,348
Stand Age	±10 percent	95.0	92.6	27	82.9	2,348
Disturbance 1	No Tolerance	99.0	74.1	27	87.7	2,313
Disturbance Year 1	±1 year	99.0	50.0	4	83.2	119
Disturbance 2	No Tolerance	99.0	44.4	9	87.1	379
Disturbance Year 2	±1 year	99.0	.	.	72.7	11
Disturbance 3	No Tolerance	99.0	100.0	5	98.2	56

(Table C continued on next page)

(Table C continued)

Variable	Tolerance	Objective (%)	South Dakota		All NRS States	
			% of data within tolerance	Observations	% of data within tolerance	Observations
Disturbance Year 3	±1 year	99.0	.	.	50.0	2
Treatment 1	No Tolerance	99.0	85.2	27	97.4	2,313
Treatment Year 1	±1 year	99.0	100.0	3	94.2	156
Treatment 2	No Tolerance	99.0	100.0	7	80.2	212
Treatment Year 2	±1 year	99.0	.	.	95.8	24
Treatment 3	No Tolerance	99.0	.	.	93.7	63
Treatment Year 3	±1 year	99.0	.	.	66.7	3
Physiographic Class	No Tolerance	80.0	63.0	27	81.3	2,348
Present Nonforest Use	No Tolerance	99.0	70.6	160	88.0	4,732
Regional Variables						
NC Land Use	No Tolerance	99.0	96.7	123	97.5	3,660
Number of conditions				160		4,732
Boundary Level						
National Variables						
Boundary Change	No Tolerance	99.0	100.0	5	80.3	701
Constraining Condition	No Tolerance	99.0	100.0	5	94.0	701
Left Azimuth	±10 degrees	90.0	80.0	5	85.7	701
Corner Mapped	No Tolerance	90.0	100.0	5	96.7	701
Corner Azimuth	±10 degrees	90.0	.	.	95.1	61
Corner Distance	±1 foot	90.0	.	.	90.2	61
Right Azimuth	±10 degrees	90.0	100.0	5	86.4	701
Number of boundaries				5		701
Subplot Level						
National Variables						
Subplot Center Condition	No Tolerance	99.0	99.1	116	97.9	8,235
Microplot Center Condition	No Tolerance	99.0	98.3	116	97.6	8,235
Slope	±10 percent	90.0	94.8	96	98.3	7,243
Aspect	±10 degrees	90.0	87.8	90	91.6	6,957
Snow/Water Depth	±0.5 foot		100.0	99	68.8	7,703
Number of subplots				116		8,235

(Table C continued)

Variable	Tolerance	Objective (%)	South Dakota		All NRS States	
			% of data within tolerance	Observations	% of data within tolerance	Observations
Tree Level						
National Variables						
DBH	±0.1 inch per 20 inches	95.0	91.8	364	94.9	32,160
DRC	±0.1 inch per 20 inches	95.0	88.9	9	72.1	43
Azimuth	±10 degrees	90.0	98.5	406	99.3	35,316
Horizontal Distance	±0.2 foot per 1.0 foot	90.0	98.0	406	98.8	35,316
Species	No Tolerance	95.0	99.8	406	98.0	35,620
Tree Genus	No Tolerance	99.0	99.8	406	99.6	35,579
Tree Status	No Tolerance	95.0	99.3	406	98.9	35,620
Rotten/Missing Cull	±10 percent	90.0	99.4	328	98.2	22,817
Total Length	±10 percent	90.0	82.0	317	78.4	22,476
Actual Length	±10 percent	90.0	75.0	28	73.8	2,710
Compacted Crown Ratio	±10 percent	80.0	87.2	343	83.3	28,939
Uncompacted Crown Ratio (P3)	±10 percent	90.0	.	.	66.7	15
Crown Class	No Tolerance	85.0	77.3	343	81.2	28,939
Decay Class	±1 class	90.0	100.0	57	95.2	4,967
Cause of Death	No Tolerance	80.0	84.2	57	84.1	4,967
Condition	No Tolerance	99.0	100.0	406	98.1	35,620
Mortality Year	±1 year	70.0	100.0	5	92.8	527
Crown Position	No Tolerance		.	.	71.4	14
Crown Light Exposure	±1 class	85.0	.	.	73.3	15
Sapling Crown Vigor Class	No Tolerance	85.0	.	.	100.0	1
Crown Density	±10 percent	90.0	.	.	57.1	14
Crown Dieback	±10 percent	90.0	.	.	100.0	14
Regional Variables						
Transparency	±10 percent	90.0	.	.	71.4	14
NC Tree Class	No Tolerance	90.0	89.1	368	91.2	31,640
NC Damage Agent 1	No Tolerance	90.0	84.5	343	88.5	28,939
NC Damage Agent 2	No Tolerance	90.0	88.6	79	82.3	6,316
Missouri Damage Code	No Tolerance		.	.	.	.
Utilization	No Tolerance	99.0	100.0	8	100.0	1,140

(Table C continued on next page)

(Table C continued)

Variable	Tolerance	Objective (%)	South Dakota		All NRS States	
			% of data within tolerance	Observations	% of data within tolerance	Observations
NC Tree Grade	No Tolerance	90.0	92.3	39	66.5	752
DBH-Live & Trees with Decay Code 1 or 2	±0.1 inch per 20 inches	95.0	91.5	342	94.8	30,178
DBH-Trees with Decay Codes 3, 4 or 5	±1 inch per 20 inches	95.0	93.3	15	99.4	1,410
Total Length-trees 40 feet and greater	±10 percent	90.0	87.9	190	80.2	18,075
Total Length-trees less than 40 feet	±10 percent	90.0	73.2	127	71.0	4,401
Total Length-trees less than 5 inches DBH	±10 percent	90.0	44.4	9	60.4	260
Number of trees				406		35,620
Seedling Level						
National Variables						
Species	No Tolerance	85.0	100.0	39	91.7	6,746
Genus	No Tolerance	90.0	100.0	39	96.7	6,746
Seedling Count	±20 percent	90.0	59.0	39	65.5	6,746
Seedling Count (coded)	No Tolerance	90.0	69.2	39	70.1	6,746
Number of microplots				30		2,871
Site Tree Level						
National Variables						
Condition List	No Tolerance	99.0	100.0	43	92.9	2,765
Diameter	±0.1 inch per 20 inches	95.0	90.7	43	95.6	2,747
Species	No Tolerance	95.0	100.0	43	98.7	2,765
Genus	No Tolerance	99.0	100.0	43	99.9	2,765
Azimuth	±10 degrees	90.0	95.3	43	98.8	2,747
Distance	±5 feet	90.0	97.7	43	99.1	2,747
Total Length	±10 percent	90.0	95.3	43	95.7	2,747
Diameter Age	±5 years	95.0	93.0	43	96.8	2,747
Regional Variables						
Site Index Method	No Tolerance	99.0	100.0	43	99.9	2,765
Field Site Index	No Tolerance	99.0	100.0	43	100.0	2,765
Number of site trees				43		2,765

Table D.—Observed relative bias values (Average [field crew—QA crew]) for measurement variables, blind check plots, South Dakota, 2010

Variable	Unit of measure	South Dakota				All NRS States			
		95% CI limits		Relative bias	Number of observations	95% CI limits		Relative bias	Number of observations
		Lower	Upper			Lower	Upper		
Plot Level									
National Variables									
Distance to Road	code	0.2	-0.2	1.0	27	0.0	-0.1	0.0	2,010
Water on Plot	code	0.1	0.0	0.4	27	0.1	0.1	0.2	2,010
Regional Variables									
Elevation	foot	13.4	-0.1	25.0	29	318.1	105.6	575.7	1,886
Latitude - decimal degrees	degree	0.0	0.0	0.0	29	0.0	0.0	0.0	1,888
Longitude - decimal degrees	degree	-0.1	-0.1	0.0	29	0.0	0.0	0.0	1,888
Latitude - distance	foot								
Longitude - distance	foot								
Number of plots					31				2,114
Condition Level									
National Variables									
Condition Status	code	0.0	0.0	0.0	160	0.0	0.0	0.0	4,732
Reserve Status	code	0.0	0.0	0.0	160	0.0	0.0	0.0	4,732
Owner Group	code	-0.7	-2.2	0.0	27	0.2	0.0	0.4	2,348
Forest Type (Type)	code	0.4	0.0	0.9	27	5.6	1.5	9.3	2,348
Forest Type (Group)	code	0.0	0.0	0.0	27	5.8	1.7	9.5	2,348
Stand Size	code	0.0	0.0	0.0	27	0.0	0.0	0.0	2,348
Regeneration Status	code	0.0	0.0	0.1	27	0.0	0.0	0.0	2,348
Tree Density	code	0.0	0.0	0.0	27	0.0	0.0	0.0	2,348
Owner Class	code	-0.7	-2.1	0.0	27	0.2	0.0	0.4	2,348
Owner Status	code	0.0	0.0	0.0	27	0.0	0.0	0.0	2,348
Regeneration Species	code	11.6	0.0	34.8	27	1.6	-0.5	3.9	2,348
Stand Age	year	-1.6	-3.6	0.1	27	-0.5	-1.4	0.1	2,348
Disturbance 1	code	-2.7	-12.0	7.2	27	0.5	0.0	1.0	2,313
Disturbance Year 1	year	3996.0	-0.5	7992.5	4	873.1	369.4	1410.5	119
Disturbance 2	code	-8.9	-26.9	8.0	9	-3.1	-4.8	-1.5	379

(Table D continued on next page)

(Table D continued)

Variable	Unit of measure	South Dakota				All NRS States			
		Relative bias	95% CI limits		Number of observations	Relative bias	95% CI limits		Number of observations
			Lower	Upper			Lower	Upper	
Disturbance Year 2	year					726.9	0.0	2180.0	11
Disturbance 3	code	0.0	0.0	0.0	5	0.4	0.0	1.1	56
Disturbance Year 3	year					1.0	0.0	2.0	2
Treatment 1	code	-3.0	-8.9	1.1	27	0.1	-0.1	0.2	2,313
Treatment Year 1	year	0.0	0.0	0.0	3	0.1	0.0	0.2	156
Treatment 2	code	0.0	0.0	0.0	7	2.8	0.7	5.3	212
Treatment Year 2	year					-0.1	-0.3	0.2	24
Treatment 3	code					-1.0	-3.0	0.5	63
Treatment Year 3	year					-0.7	-1.3	0.0	3
Physiographic Class	code	-2.6	-4.5	-0.9	27	0.1	0.0	0.3	2,348
Present Nonforest Use	code	1.2	0.5	1.9	160	0.1	0.0	0.2	4,732
Regional Variables									
NC Land Use	code	-0.5	-1.4	0.0	123	-0.1	-0.1	0.0	3,660
Number of conditions					160				4,732
Boundary Level									
National Variables									
Boundary Change	code	0.0	0.0	0.0	5	0.0	0.0	0.1	701
Constrasting Condition	cond	0.0	0.0	0.0	5	0.0	0.0	0.0	701
Left Azimuth	degree	-4.0	-12.0	0.0	5	2.6	-0.8	5.9	701
Corner Mapped	code	0.0	0.0	0.0	5	0.0	0.0	0.0	701
Corner Azimuth	degree					-0.6	-2.2	1.1	61
Corner Distance	foot					0.1	-0.2	0.4	61
Right Azimuth	degree	0.4	0.0	1.2	5	-1.0	-4.3	2.5	701
Number of boundaries					5				701

(Table D continued on next page)

(Table D continued)

Variable	Unit of measure	South Dakota			All NRS States				
		Relative bias	95% CI limits		Number of observations	Relative bias	95% CI limits		Number of observations
			Lower	Upper			Lower	Upper	
Subplot Level									
National Variables									
Subplot Center Condition	code	0.0	0.0	0.0	116	0.0	0.0	0.0	8,235
Microplot Center Condition	code	0.0	0.0	0.0	116	0.0	0.0	0.0	8,235
Slope	percent	1.3	-0.7	4.2	96	0.0	-0.1	0.1	7,243
Aspect	degree	5.1	-0.5	14.2	90	1.0	0.2	1.9	6,957
Snow/Water Depth	foot	0.0	0.0	0.0	99	-0.1	-0.2	0.0	7,703
Number of subplots					116				8,235
Tree Level									
National Variables									
DBH	inch	-0.1	-0.1	0.0	364	-0.1	-0.1	0.0	32,160
DRC	inch	-0.1	-0.4	0.1	9	0.0	-0.2	0.2	43
Azimuth	degree	0.0	-0.8	0.6	406	0.0	-0.1	0.1	35,316
Horizontal Distance	foot	0.0	-0.1	0.0	406	0.0	0.0	0.0	35,316
Species	code	-1.3	-3.8	0.0	406	0.1	-0.2	0.3	35,620
Tree Genus	code	-1.3	-3.8	0.0	406	0.1	-0.2	0.3	35,579
Tree Status	code	0.0	0.0	0.0	406	0.0	0.0	0.0	35,620
Rotten/Missing Cull	percent	0.1	-0.1	0.3	328	-0.1	-0.2	-0.1	22,817
Total Length	foot	0.6	-0.4	1.7	317	0.2	0.0	0.4	22,476
Actual Length	foot	-1.4	-9.5	4.3	28	-2.5	-4.1	-1.1	2,710
Compacted Crown Ratio	percent	0.3	-0.8	1.4	343	-0.1	-0.2	0.0	28,939
Uncompacted Crown Ratio (P3)	percent					6.3	-4.8	12.7	15
Crown Class	code	0.0	-0.1	0.0	343	0.0	0.0	0.0	28,939
Decay Class	code	-0.1	-0.2	0.0	57	0.0	0.0	0.0	4,967
Cause of Death	code	5.1	1.2	9.4	57	2.3	1.9	2.7	4,967
Condition	code	0.0	0.0	0.0	406	0.0	0.0	0.0	35,620
Mortality Year	year	0.0	0.0	0.0	5	0.1	0.1	0.2	527
Crown Position	code					0.1	-0.3	0.4	14
Crown Light Exposure	code					-0.4	-1.1	0.2	15

(Table D continued on next page)

(Table D continued)

Variable	Unit of measure	South Dakota				All NRS States			
		Relative bias	95% CI limits		Number of observations	Relative bias	95% CI limits		Number of observations
			Lower	Upper			Lower	Upper	
Sapling Crown Vigor Class	code					0.0	0.0	0.0	1
Crown Density	percent					-0.4	-9.1	7.9	14
Crown Dieback	percent					-1.4	-3.2	-0.4	14
Transparency	percent					-4.3	-8.8	0.4	14
Regional Variables									
NC Tree Class	code	0.2	0.0	0.3	368	0.0	-0.1	0.0	31,640
NC Damage Agent 1	code	-16.4	-31.7	-2.8	343	5.5	4.1	6.8	28,939
NC Damage Agent 2	code	-12.4	-45.4	20.6	79	20.5	17.3	23.8	6,316
Missouri Damage Code	code								
Utilization	code	0.0	0.0	0.0	8	0.0	0.0	0.0	1,140
NC Tree Grade	code	2.6	-16.7	20.5	39	-1.5	-10.2	7.3	752
DBH-Live & Trees with Decay Code 1 or 2	inch	0.0	-0.1	0.0	342	0.0	0.0	0.0	30,178
DBH-Trees with Decay Codes 3, 4 or 5	inch	-0.4	-1.4	0.0	15	0.0	0.0	0.0	1,410
Total Length-trees 40 feet and greater	foot	0.7	-0.4	1.8	190	0.8	0.7	0.9	18,075
Total Length-trees less than 40 feet	foot	0.5	-1.7	2.8	127	-2.2	-3.1	-1.5	4,401
Total Length-trees less than 5 inches DBH	foot	11.2	6.3	17.5	9	-0.7	-2.7	0.9	260
Number of trees					406				35,620
Seedling Level									
National Variables									
Species	code	0.0	0.0	0.0	39	0.0	0.0	0.0	6,746
Genus	code	0.0	0.0	0.0	39	0.0	0.0	0.0	6,746
Seedling Count	number	-30.8	-107.7	14.4	39	-15.9	-22.8	-11.8	6,746
Seedling Count (coded)	number	0.4	-0.2	1.0	39	0.0	0.0	0.0	6,746
Number of microplots					30				2,871

(Table D continued on next page)

(Table D continued)

Variable	Unit of measure	South Dakota				All NRS States			
		Relative bias	95% CI limits		Number of observations	Relative bias	95% CI limits		Number of observations
			Lower	Upper			Lower	Upper	
Site Tree Level									
National Variables									
Condition List	code	0.0	0.0	0.0	43	-5.8	-13.6	2.1	2,765
Diameter	inch	-0.1	-0.2	0.0	43	0.0	0.0	0.0	2,747
Species	code	0.0	0.0	0.0	43	0.0	-0.1	0.0	2,765
Genus	code	0.0	0.0	0.0	43	0.0	-0.1	0.0	2,765
Azimuth	degree	-0.2	-2.7	1.4	43	0.1	-0.4	0.5	2,747
Distance	foot	-0.3	-1.0	0.2	43	0.0	-0.1	0.0	2,747
Total Length	foot	-1.3	-3.5	0.5	43	-0.3	-0.5	-0.1	2,747
Diameter Age	year	-0.5	-1.8	0.4	43	0.1	0.0	0.2	2,747
Regional Variables									
Site Index Method	code	0.0	0.0	0.0	43	0.0	0.0	0.0	2,765
Field Site Index	feet	0.0	0.0	0.0	43	0.0	0.0	0.0	2,765
Number of site trees					43				2,765

Table E.—FIA nonresponse by strata, South Dakota, 2010

Owner	Strata (um)	Number of plots selected	Sampled	Denied access	Hazardous	Other	Response Rate (%)
----- number of plots -----							
Black Hills NF	1	32	31.8	0	0.3	0	99.2
	2	57	57	0	0	0	100
	3	27	27	0	0	0	100
	4	33	32.7	0	0.3	0	99.2
	5	38	38	0	0	0	100
Other National Forest/Grassland	1, 2, 3, 4, 5	150	150	0	0	0	100
Inland Census Water and other Public	1, 2, 3, 4, 5	463	459.8	3	0.3	0	99.3
Private	1	7296	7288.8	6	1.3	0	99.9
	2	143	135.4	6	1.7	0	94.7
	3	32	27.8	3	1.3	0	86.9
	4, 5	30	26.8	2	1.3	0	89.3
Total		8,301	8,275.10	20	6.5	0	99.7

Strata codes:

- 1: Canopy cover 0 - 5
- 2: Canopy cover 6 - 50
- 3: Canopy cover 51 - 65
- 4: Canopy cover 66 - 80
- 5: Canopy cover 81 - 100

Table SD-1.—Percentage of area by land status, South Dakota, 2010

Land status	Percentage of area
Accessible forest land	
Unreserved forest land	
Timberland	3.5
Unproductive	0.2
Total unreserved forest land	3.6
Reserved forest land	
Productive	0.1
Unproductive	--
Total reserved forest land	0.1
All accessible forest land	3.7
Nonforest and other land	
Nonforest land	94.1
Water	
Census	1.6
Non-Census	0.3
All nonforest and other land	96.0
Nonsampled land	
Access denied	0.2
Hazardous conditions	0.1
Other	--
All land	100.0
Total area (thousands of acres)	49,354

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the percentage rounds to less than 0.1 percent. Columns and rows may not add to their totals due to rounding.

Table SD-2.—Area of forest land, in thousand acres, by owner class and forest-land status, South Dakota, 2010

Owner class	Unreserved forests			Reserved forests			All forest land
	Timberland	Unproductive	Total	Productive	Unproductive	Total	
Forest Service							
National forest	992.2	11.5	1,003.6	14.1	--	14.1	1,017.7
Other Federal							
National Park Service	--	--	--	16.1	--	16.1	16.1
Bureau of Land Management	14.8	--	14.8	--	--	--	14.8
State and local government							
State	73.9	--	73.9	--	--	--	73.9
Local (county, municipal, etc.)	5.6	--	5.6	--	--	--	5.6
Private							
Undifferentiated private	678.1	76.8	754.9	--	--	--	754.9
All owners	1,764.6	88.2	1,852.8	30.2	--	30.2	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-3.—Area of forest land, in thousand acres, by forest-type group, forest type, and productivity class, South Dakota, 2010

Forest-type group/ forest type	Site-productivity class (cubic feet/acre/year)					
	0-19	20-49	50-84	85-119	120-164	165-224
All classes						
225+						
All classes						
Softwood type groups						
White / red / jack pine group						
Red pine	--	9.8	--	--	--	--
Total	--	9.8	--	--	--	9.8
Spruce / fir group						
White spruce	--	38.7	18.5	--	--	--
Total	--	38.7	18.5	--	--	57.2
Other eastern softwoods group						
Eastern redcedar	13.0	29.1	--	--	--	--
Total	13.0	29.1	--	--	--	42.2
Pinyon / juniper group						
Rocky Mountain juniper	--	53.4	--	--	--	--
Total	--	53.4	--	--	--	53.4
Ponderosa pine group						
Ponderosa pine	--	968.2	151.3	12.1	--	--
Total	--	968.2	151.3	12.1	--	1,131.6
All softwood groups						
Total	13.0	1,099.2	169.8	12.1	--	--
Hardwood type groups						
Oak / pine group						
Eastern redcedar / hardwood	7.6	--	--	--	--	--
Total	7.6	--	--	--	--	7.6
Oak / hickory group						
Bur oak	35.4	48.6	--	--	--	--
Elm / ash / black locust	--	42.4	--	--	--	--
Mixed upland hardwoods	7.3	--	4.0	--	--	--
Total	42.7	91.1	4.0	--	--	137.8
Elm / ash / cottonwood group						
Cottonwood	1.5	55.0	1.6	--	--	--
Sugarberry / hackberry / elm / green ash	4.5	95.7	--	--	--	--
Cottonwood / willow	--	5.2	--	--	--	--
Total	5.9	155.9	1.6	--	--	163.4
Maple / beech / birch group						
Sugar maple / beech / yellow birch	--	9.8	--	--	--	--
Total	--	9.8	--	--	--	9.8
Aspen / birch group						
Aspen	5.7	47.3	6.1	--	--	--
Paper birch	--	6.1	--	--	--	--
Total	5.7	53.4	6.1	--	--	65.2
Other hardwoods group						
Other hardwoods	--	29.3	--	5.7	--	--
Total	--	29.3	--	5.7	--	35.0
Exotic hardwoods group						
Other exotic hardwoods	--	32.2	--	--	--	--
Total	--	32.2	--	--	--	32.2
All hardwood groups						
Total	62.0	371.7	11.6	5.7	--	--
Nonstocked						
Total	13.2	123.2	1.5	--	--	--
All forest groups						
Total	88.2	1,594.1	182.9	17.8	--	--

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-4.—Area of forest land, in thousand acres, by forest-type group, ownership group, and forest-land status, South Dakota, 2010

Forest-type group/ forest type	Forest Service		Other Federal		State and local government		Undifferentiated private		All forest land
	Timber- land	Other forest land	Timber- land	Other forest land	Timber- land	Other forest land	Timber- land	Other forest land	
Softwood type groups									
White / red / jack pine group									
Red pine	--	--	--	--	--	--	9.8	--	9.8
Total	--	--	--	--	--	--	9.8	--	9.8
Spruce / fir group									
White spruce	51.8	--	5.4	--	--	--	--	--	57.2
Total	51.8	--	5.4	--	--	--	--	--	57.2
Other eastern softwoods group									
Eastern redcedar	--	--	--	--	--	--	29.1	13.0	42.2
Total	--	--	--	--	--	--	29.1	13.0	42.2
Pinyon / juniper group									
Rocky Mountain juniper	11.4	--	1.3	--	--	--	40.7	--	53.4
Total	11.4	--	1.3	--	--	--	40.7	--	53.4
Ponderosa pine group									
Ponderosa pine	780.1	14.1	5.4	16.1	45.1	--	270.8	--	1,131.6
Total	780.1	14.1	5.4	16.1	45.1	--	270.8	--	1,131.6
All softwood groups									
Total	843.3	14.1	12.1	16.1	45.1	--	350.4	13.0	1,294.2
Hardwood type groups									
Oak / pine group									
Eastern redcedar / hardwood	--	--	--	--	--	--	--	7.6	7.6
Total	--	--	--	--	--	--	--	7.6	7.6
Oak / hickory group									
Bur oak	--	--	--	--	--	--	48.6	35.4	84.0
Elm / ash / black locust	--	--	--	--	5.6	--	36.8	--	42.4
Mixed upland hardwoods	--	--	--	--	--	--	4.0	7.3	11.3
Total	--	--	--	--	5.6	--	89.4	42.7	137.8
Elm / ash / cottonwood group									
Cottonwood	--	--	--	--	7.8	--	48.8	1.5	58.1
Sugarberry / hackberry / elm / green ash	--	--	--	--	1.6	--	94.1	4.5	100.1
Cottonwood / willow	--	--	--	--	--	--	5.2	--	5.2
Total	--	--	--	--	9.4	--	148.1	5.9	163.4
Maple / beech / birch group									
Sugar maple / beech / yellow birch	--	--	--	--	--	--	9.8	--	9.8
Total	--	--	--	--	--	--	9.8	--	9.8
Aspen / birch group									
Aspen	45.9	5.7	--	--	--	--	7.5	--	59.1
Paper birch	6.1	--	--	--	--	--	--	--	6.1
Total	52.0	5.7	--	--	--	--	7.5	--	65.2
Other hardwoods group									
Other hardwoods	17.5	--	--	--	--	--	17.5	--	35.0
Total	17.5	--	--	--	--	--	17.5	--	35.0
Exotic hardwoods group									
Other exotic hardwoods	--	--	--	--	--	--	32.2	--	32.2
Total	--	--	--	--	--	--	32.2	--	32.2
All hardwood groups									
Total	69.5	5.7	--	--	15.0	--	304.5	56.3	451.0
Nonstocked									
Total	79.4	5.8	2.8	--	19.4	--	23.1	7.5	137.9
All forest groups									
Total	992.2	25.5	14.8	16.1	79.5	--	678.1	76.8	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-5.—Area of forest land, in thousand acres, by forest-type group, forest type, and stand-size class, South Dakota, 2010

Forest-type group/ forest type	Large diameter	Medium diameter	Small diameter	Nonstocked	All stands
Softwood type groups					
White / red / jack pine group					
Red pine	--	9.8	--	--	9.8
Total	--	9.8	--	--	9.8
Spruce / fir group					
White spruce	51.8	5.4	--	--	57.2
Total	51.8	5.4	--	--	57.2
Other eastern softwoods group					
Eastern redcedar	7.6	4.5	30.1	--	42.2
Total	7.6	4.5	30.1	--	42.2
Pinyon / juniper group					
Rocky Mountain juniper	34.0	11.8	7.6	--	53.4
Total	34.0	11.8	7.6	--	53.4
Ponderosa pine group					
Ponderosa pine	893.7	107.3	130.6	--	1,131.6
Total	893.7	107.3	130.6	--	1,131.6
All softwood groups					
	987.1	138.8	168.3	--	1,294.2
Hardwood type groups					
Oak / pine group					
Eastern redcedar / hardwood	--	--	7.6	--	7.6
Total	--	--	7.6	--	7.6
Oak / hickory group					
Bur oak	27.7	54.5	1.9	--	84.0
Elm / ash / black locust	10.9	23.9	7.6	--	42.4
Mixed upland hardwoods	4.0	7.3	--	--	11.3
Total	42.5	85.8	9.5	--	137.8
Elm / ash / cottonwood group					
Cottonwood	56.6	1.5	--	--	58.1
Sugarberry / hackberry / elm / green ash	79.0	3.8	17.4	--	100.1
Cottonwood / willow	5.2	--	--	--	5.2
Total	140.7	5.3	17.4	--	163.4
Maple / beech / birch group					
Sugar maple / beech / yellow birch	9.8	--	--	--	9.8
Total	9.8	--	--	--	9.8
Aspen / birch group					
Aspen	5.2	19.1	34.8	--	59.1
Paper birch	--	--	6.1	--	6.1
Total	5.2	19.1	40.9	--	65.2
Other hardwoods group					
Other hardwoods	--	1.5	33.5	--	35.0
Total	--	1.5	33.5	--	35.0
Exotic hardwoods group					
Other exotic hardwoods	9.7	22.6	--	--	32.2
Total	9.7	22.6	--	--	32.2
All hardwood groups					
	207.9	134.2	108.9	--	451.0
Nonstocked					
	--	--	--	137.9	137.9
All forest groups					
	1,194.9	273.0	277.2	137.9	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-6.—Area of forest land, in thousand acres, by forest-type group, forest type, and stand-age class, South Dakota, 2010

Forest-type group/ forest type	Non stocked	Stand-age class (years)										All classes	
		0-20	21-40	41-60	61-80	81-100	101-120	121-140	141-160	161-180	181-200		201+
Softwood type groups													
White / red / jack pine group													
Red pine	--	--	9.8	--	--	--	--	--	--	--	--	--	9.8
Total	--	--	9.8	--	--	--	--	--	--	--	--	--	9.8
Spruce / fir group													
White spruce	--	--	5.7	11.3	15.1	7.6	5.4	--	12.2	--	--	--	57.2
Total	--	--	5.7	11.3	15.1	7.6	5.4	--	12.2	--	--	--	57.2
Other eastern softwoods group													
Eastern redcedar	--	2.4	10.4	11.4	17.9	--	--	--	--	--	--	--	42.2
Total	--	2.4	10.4	11.4	17.9	--	--	--	--	--	--	--	42.2
Pinyon / juniper group													
Rocky Mountain juniper	--	--	4.3	7.3	30.5	11.3	--	--	--	--	--	--	53.4
Total	--	--	4.3	7.3	30.5	11.3	--	--	--	--	--	--	53.4
Ponderosa pine group													
Ponderosa pine	--	36.8	49.1	122.0	283.9	345.4	143.1	86.2	34.4	14.0	15.2	1.6	1,131.6
Total	--	36.8	49.1	122.0	283.9	345.4	143.1	86.2	34.4	14.0	15.2	1.6	1,131.6
All softwood groups													
Total	--	39.3	79.3	151.9	347.3	364.3	148.4	86.2	46.6	14.0	15.2	1.6	1,294.2
Hardwood type groups													
Oak / pine group													
Eastern redcedar / hardwood	--	--	--	7.6	--	--	--	--	--	--	--	--	7.6
Total	--	--	--	7.6	--	--	--	--	--	--	--	--	7.6
Oak / hickory group													
Bur oak	--	--	5.9	18.7	13.5	34.2	11.6	--	--	--	--	--	84.0
Elm / ash / black locust	--	--	12.2	9.3	7.2	6.2	7.6	--	--	--	--	--	42.4
Mixed upland hardwoods	--	--	--	--	7.3	--	4.0	--	--	--	--	--	11.3
Total	--	--	18.1	28.0	28.0	40.4	23.2	--	--	--	--	--	137.8
Elm / ash / cottonwood group													
Cottonwood	--	--	4.5	22.7	18.6	5.9	6.2	--	--	--	--	--	58.1
Sugarberry / hackberry / elm / green ash	--	--	18.8	33.9	17.3	30.2	--	--	--	--	--	--	100.1
Cottonwood / willow	--	--	--	5.2	--	--	--	--	--	--	--	--	5.2
Total	--	--	23.3	61.8	35.9	36.1	6.2	--	--	--	--	--	163.4
Maple / beech / birch group													
Sugar maple / beech / yellow birch	--	--	--	--	9.8	--	--	--	--	--	--	--	9.8
Total	--	--	--	--	9.8	--	--	--	--	--	--	--	9.8
Aspen / birch group													
Aspen	--	1.5	6.1	17.6	5.7	28.2	--	--	--	--	--	--	59.1
Paper birch	--	--	--	--	--	6.1	--	--	--	--	--	--	6.1
Total	--	1.5	6.1	17.6	5.7	34.3	--	--	--	--	--	--	65.2
Other hardwoods group													
Other hardwoods	--	11.6	5.7	1.5	4.5	6.0	5.8	--	--	--	--	--	35.0
Total	--	11.6	5.7	1.5	4.5	6.0	5.8	--	--	--	--	--	35.0
Exotic hardwoods group													
Other exotic hardwoods	--	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	5.9	--	26.3	--	--	--	--	--	--	--	--	32.2
All hardwood groups													
Total	--	5.9	--	26.3	--	--	--	--	--	--	--	--	32.2
Nonstocked													
Total	137.9	--	--	--	--	--	35.2	--	--	--	--	--	451.0
All forest groups													
Total	137.9	58.3	132.5	294.7	431.2	481.1	183.6	86.2	46.6	14.0	15.2	1.6	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-7.—Area of forest land, in thousand acres, by forest-type group, forest type, and stand origin, South Dakota, 2010Pennsylvania, 2009

Forest-type group/ forest type	Stand origin		All forest land
	Natural stands	Artificial regeneration	
Softwood type groups			
White / red / jack pine group			
Red pine	--	9.8	9.8
Total	--	9.8	9.8
Spruce / fir group			
White spruce	57.2	--	57.2
Total	57.2	--	57.2
Other eastern softwoods group			
Eastern redcedar	37.7	4.5	42.2
Total	37.7	4.5	42.2
Pinyon / juniper group			
Rocky Mountain juniper	53.4	--	53.4
Total	53.4	--	53.4
Ponderosa pine group			
Ponderosa pine	1,125.5	6.1	1,131.6
Total	1,125.5	6.1	1,131.6
All softwood groups			
Hardwood type groups			
Oak / pine group			
Eastern redcedar / hardwood	7.6	--	7.6
Total	7.6	--	7.6
Oak / hickory group			
Bur oak	84.0	--	84.0
Elm / ash / black locust	42.4	--	42.4
Mixed upland hardwoods	11.3	--	11.3
Total	137.8	--	137.8
Elm / ash / cottonwood group			
Cottonwood	58.1	--	58.1
Sugarberry / hackberry / elm / green ash	90.6	9.6	100.1
Cottonwood / willow	5.2	--	5.2
Total	153.8	9.6	163.4
Maple / beech / birch group			
Sugar maple / beech / yellow birch	9.8	--	9.8
Total	9.8	--	9.8
Aspen / birch group			
Aspen	59.1	--	59.1
Paper birch	6.1	--	6.1
Total	65.2	--	65.2
Other hardwoods group			
Other hardwoods	35.0	--	35.0
Total	35.0	--	35.0
Exotic hardwoods group			
Other exotic hardwoods	17.3	15.0	32.2
Total	17.3	15.0	32.2
All hardwood groups			
Nonstocked	426.4	24.6	451.0
Total	137.9	--	137.9
All forest groups	1,838.1	44.9	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-8.—Area of forest land, in thousand acres, by forest-type group, forest type, and disturbance class, South Dakota, 2010

Forest-type group/ forest type	Disturbance class							All forest land
	None	Insects	Disease	Weather	Fire	Domestic animals	Wild animals	Other
Softwood type groups								
White / red / jack pine group								
Red pine	9.8	--	--	--	--	--	--	--
Total	9.8	--	--	--	--	--	--	9.8
Spruce / fir group								
White spruce	19.5	5.7	--	--	--	25.9	6.1	--
Total	19.5	5.7	--	--	--	25.9	6.1	57.2
Other eastern softwoods group								
Eastern redcedar	27.4	--	--	--	--	14.8	--	--
Total	27.4	--	--	--	--	14.8	--	42.2
Pinyon / juniper group								
Rocky Mountain juniper	35.8	--	--	--	--	17.6	--	--
Total	35.8	--	--	--	--	17.6	--	53.4
Ponderosa pine group								
Ponderosa pine	720.6	29.0	--	17.0	48.7	205.9	52.6	--
Total	720.6	29.0	--	17.0	48.7	205.9	52.6	1,131.6
All softwood groups								
	813.0	34.7	--	17.0	48.7	264.3	58.7	--
Total								1,294.2
Hardwood type groups								
Oak / pine group								
Eastern redcedar / hardwood	--	--	--	--	--	7.6	--	--
Total	--	--	--	--	--	7.6	--	7.6
Oak / hickory group								
Bur oak	64.8	--	--	--	1.9	17.3	--	--
Elm / ash / black locust	19.9	1.5	--	--	--	11.2	9.9	--
Mixed upland hardwoods	11.3	--	--	--	--	--	--	--
Total	95.9	1.5	--	--	1.9	28.6	9.9	137.8
Elm / ash / cottonwood group								
Cottonwood	45.3	--	--	--	--	6.5	--	6.2
Sugarberry / hackberry / elm / green ash	69.2	--	--	--	8.1	21.3	--	1.5
Cottonwood / willow	5.2	--	--	--	--	--	--	5.2
Total	119.7	--	--	--	8.1	27.9	--	7.7
Maple / beech / birch group								
Sugar maple / beech / yellow birch	9.8	--	--	--	--	--	--	9.8
Total	9.8	--	--	--	--	--	--	9.8
Aspen / birch group								
Aspen	29.4	--	--	--	--	11.4	13.2	5.2
Paper birch	6.1	--	--	--	--	--	--	--
Total	35.5	--	--	--	--	11.4	13.2	5.2
Other hardwoods group								
Other hardwoods	19.0	--	--	--	4.5	11.6	--	--
Total	19.0	--	--	--	4.5	11.6	--	35.0
Exotic hardwoods group								
Other exotic hardwoods	32.2	--	--	--	--	--	--	--
Total	32.2	--	--	--	--	--	--	32.2
All hardwood groups								
	312.1	1.5	--	--	14.5	87.0	23.0	5.2
Nonstocked	59.2	--	--	--	7.2	71.4	--	--
Total	1,184.3	36.2	--	--	70.4	422.7	81.7	62.9
All forest groups								7.7

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-9.—Area of timberland, in thousand acres, by forest-type group, forest type, and stand-size class, South Dakota, 2010

Forest-type group/ forest type	Stand-size class			All stands
	Large diameter	Medium diameter	Small diameter	
Softwood type groups				
White / red / jack pine group				
Red pine	--	9.8	--	9.8
Total	--	9.8	--	9.8
Spruce / fir group				
White spruce	51.8	5.4	--	57.2
Total	51.8	5.4	--	57.2
Other eastern softwoods group				
Eastern redcedar	7.6	4.5	17.1	29.1
Total	7.6	4.5	17.1	29.1
Pinyon / juniper group				
Rocky Mountain juniper	34.0	11.8	7.6	53.4
Total	34.0	11.8	7.6	53.4
Ponderosa pine group				
Ponderosa pine	866.4	104.5	130.6	1,101.4
Total	866.4	104.5	130.6	1,101.4
All softwood groups	959.8	135.9	155.3	1,251.0
Hardwood type groups				
Oak / hickory group				
Bur oak	11.7	35.0	1.9	48.6
Elm / ash / black locust	10.9	23.9	7.6	42.4
Mixed upland hardwoods	4.0	--	--	4.0
Total	26.6	59.0	9.5	95.0
Elm / ash / cottonwood group				
Cottonwood	56.6	--	--	56.6
Sugarberry / hackberry / elm / green ash	74.5	3.8	17.4	95.7
Cottonwood / willow	5.2	--	--	5.2
Total	136.3	3.8	17.4	157.5
Maple / beech / birch group				
Sugar maple / beech / yellow birch	9.8	--	--	9.8
Total	9.8	--	--	9.8
Aspen / birch group				
Aspen	5.2	13.4	34.8	53.4
Paper birch	--	--	6.1	6.1
Total	5.2	13.4	40.9	59.5
Other hardwoods group				
Other hardwoods	--	1.5	33.5	35.0
Total	--	1.5	33.5	35.0
Exotic hardwoods group				
Other exotic hardwoods	9.7	22.6	--	32.2
Total	9.7	22.6	--	32.2
All hardwood groups				
	187.5	100.2	101.3	389.0
Nonstocked	--	--	124.7	124.7
All forest groups	1,147.2	236.1	256.6	1,764.6

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Table SD-10.—Number of live trees (at least 1 inch d.b.h/d.r.c.), in thousand trees, on forest land by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)															All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0- 36.9	37.0+	
Softwood wood species groups																
Eastern white and red pines																
Red pine	--	--	1,351	822	59	--	--	--	--	--	--	--	--	--	--	2,232
Total	--	--	1,351	822	59	--	--	--	--	--	--	--	--	--	--	2,232
Spruce and balsam fir																
White spruce	11,749	6,023	2,574	2,163	1,351	935	911	558	178	72	32	--	--	--	--	26,547
Total	11,749	6,023	2,574	2,163	1,351	935	911	558	178	72	32	--	--	--	--	26,547
Other eastern softwoods																
Eastern redcedar	7,255	3,677	1,301	907	657	250	46	--	--	--	--	--	--	--	--	14,093
Ponderosa pine	122,275	57,381	40,577	39,821	28,088	18,725	11,315	5,985	3,934	1,680	925	194	59	--	--	330,959
Total	129,530	61,058	41,879	40,728	28,745	18,976	11,360	5,985	3,934	1,680	925	194	59	--	--	345,052
Woodland softwoods																
Rocky Mountain juniper	5,644	3,931	2,750	2,293	1,214	329	239	170	34	--	36	68	--	--	--	16,706
Total	5,644	3,931	2,750	2,293	1,214	329	239	170	34	--	36	68	--	--	--	16,706
Total softwoods																
	146,923	71,011	48,553	46,006	31,369	20,240	12,509	6,713	4,145	1,753	993	262	59	--	--	390,537
Hardwood species groups																
Select white oaks																
Bur oak	6,211	8,457	7,134	4,169	1,378	1,021	541	314	179	81	161	--	--	--	--	29,646
Total	6,211	8,457	7,134	4,169	1,378	1,021	541	314	179	81	161	--	--	--	--	29,646
Soft maple																
Silver maple	--	--	36	36	107	36	36	36	--	--	--	--	--	--	--	286
Total	--	--	36	36	107	36	36	36	--	--	--	--	--	--	--	286
Ash																
Green ash	7,848	4,505	2,823	2,551	1,278	1,075	554	348	205	195	46	111	--	--	--	21,538
Total	7,848	4,505	2,823	2,551	1,278	1,075	554	348	205	195	46	111	--	--	--	21,538
Cottonwood and aspen																
Eastern cottonwood	--	446	212	333	140	115	123	176	36	104	36	87	117	--	--	1,926
Plains cottonwood	--	--	--	--	71	--	157	75	105	75	113	46	--	36	46	724
Quaking aspen	14,714	1,769	1,883	1,793	523	173	32	--	--	--	--	--	--	--	--	20,888
Total	14,714	2,214	2,095	2,127	735	288	312	251	141	180	149	133	117	36	46	23,538
Basswood																
American basswood	--	--	197	36	46	--	--	--	--	--	--	--	--	--	--	278
Total	--	--	197	36	46	--	--	--	--	--	--	--	--	--	--	278
Black walnut																
Black walnut	446	--	59	36	72	72	--	--	--	--	--	--	--	--	--	683
Total	446	--	59	36	72	72	--	--	--	--	--	--	--	--	--	683
Other eastern soft hardwoods																
Boxelder	3,776	1,197	868	406	597	587	282	129	72	36	81	--	--	--	--	8,030
Paper birch	11,522	3,089	821	244	--	--	--	--	--	--	--	--	--	--	--	15,676
Hackberry	468	--	187	163	199	212	104	--	--	--	--	--	--	--	--	1,334
White willow	520	--	--	--	--	--	--	--	--	--	--	42	--	--	--	561
American elm	520	2,104	1,552	1,395	771	335	199	46	91	127	199	46	--	--	--	7,384
Siberian elm	--	--	710	733	563	225	153	--	--	--	--	--	--	--	--	2,383
Slippery elm	--	--	--	46	--	--	--	--	--	--	--	--	--	--	--	46
Total	16,805	6,389	4,138	2,986	2,130	1,359	739	175	163	163	280	87	--	--	--	35,415

(Table SD-10 continued on next page)

(Table SD-10 continued)

Species group/ species	Diameter class (inches)															All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0- 36.9	37.0+	
Other eastern hard hardwoods																
Honeylocust	--	--	179	143	36	--	--	--	--	--	--	--	--	--	--	358
Red mulberry	937	--	293	73	38	--	--	--	--	--	--	--	--	--	--	1,341
Total	937	--	472	216	73	--	--	--	--	--	--	--	--	--	--	1,699
Eastern noncommercial hardwoods																
Prairie crab apple	--	--	107	72	36	--	--	--	--	--	--	--	--	--	--	215
Eastern hophornbeam	20,908	4,564	469	36	--	--	--	--	--	--	--	--	--	--	--	25,977
Chokecherry	6,859	891	72	--	--	--	--	--	--	--	--	--	--	--	--	7,822
Willow spp.	--	--	31	--	--	--	--	--	--	--	--	--	--	--	--	31
Russian-olive	--	--	250	83	--	42	--	--	--	--	--	--	--	--	--	375
Other or unknown live tree	--	--	36	--	--	--	--	--	--	--	--	--	--	--	--	36
Total	27,767	5,455	965	191	36	42	--	--	--	--	--	--	--	--	--	34,456
Total hardwoods	74,727	27,020	17,918	12,348	5,855	3,891	2,182	1,124	688	619	636	331	117	36	46	147,538
All species groups	221,650	98,031	66,471	58,354	37,224	24,131	14,691	7,837	4,833	2,372	1,629	594	176	36	46	538,075

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the number of trees rounds to less than 1 thousand trees. Columns and rows may not add to their totals due to rounding.

Table SD-11.—Number of growing-stock trees (at least 1 inch d.b.h.), in thousand trees, on timberland by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)													All classes
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0+		
Softwood wood species groups														
Eastern white and red pines														
Red pine	1,233	646	59	--	--	--	--	--	--	--	--	--	1,938	
Total	1,233	646	59	--	--	--	--	--	--	--	--	--	1,938	
Spruce and balsam fir														
White spruce	2,506	2,163	1,315	861	657	558	141	72	32	--	--	--	8,306	
Total	2,506	2,163	1,315	861	657	558	141	72	32	--	--	--	8,306	
Other eastern softwoods														
Eastern redcedar	560	523	358	179	46	--	--	--	--	--	--	--	1,665	
Ponderosa pine	34,622	36,916	25,816	17,566	10,688	5,549	3,704	1,648	807	160	--	--	137,477	
Total	35,182	37,438	26,174	17,745	10,734	5,549	3,704	1,648	807	160	--	--	139,142	
Total softwoods	38,922	40,248	27,548	18,606	11,390	6,108	3,845	1,720	839	160	--	--	149,386	
Hardwood species groups														
Select white oaks														
Bur oak	1,457	816	431	430	195	36	36	--	--	--	--	--	3,401	
Total	1,457	816	431	430	195	36	36	--	--	--	--	--	3,401	
Soft maple														
Silver maple	--	--	36	--	--	--	--	--	--	--	--	--	36	
Total	--	--	36	--	--	--	--	--	--	--	--	--	36	
Ash														
Green ash	964	1,169	395	430	326	70	46	34	--	36	--	--	3,468	
Total	964	1,169	395	430	326	70	46	34	--	36	--	--	3,468	
Cottonwood and aspen														
Eastern cottonwood	104	119	104	83	87	176	36	104	36	87	72	--	1,010	
Plains cottonwood	--	--	38	--	121	75	--	75	113	--	--	36	457	
Quaking aspen	1,129	1,136	417	67	--	--	--	--	--	--	--	--	2,750	
Total	1,234	1,255	560	151	208	251	36	180	149	87	72	36	4,217	
Basswood														
American basswood	119	--	46	--	--	--	--	--	--	--	--	--	165	
Total	119	--	46	--	--	--	--	--	--	--	--	--	165	
Black walnut														
Black walnut	59	36	--	36	--	--	--	--	--	--	--	--	130	
Total	59	36	--	36	--	--	--	--	--	--	--	--	130	
Other eastern soft hardwoods														
Boxelder	--	36	83	36	36	--	--	--	--	--	--	--	191	
Paper birch	649	209	--	--	--	--	--	--	--	--	--	--	857	
Hackberry	187	104	163	117	--	--	--	--	--	--	--	--	573	
American elm	1,000	696	356	163	104	46	46	81	46	--	--	--	2,538	
Siberian elm	46	212	189	81	--	--	--	--	--	--	--	--	528	
Total	1,881	1,257	792	398	140	46	46	81	46	--	--	--	4,686	
Other eastern hard hardwoods														
Honeylocust	179	143	36	--	--	--	--	--	--	--	--	--	358	
Red mulberry	143	36	--	--	--	--	--	--	--	--	--	--	179	
Total	322	179	36	--	--	--	--	--	--	--	--	--	537	
Total hardwoods	6,036	4,711	2,294	1,444	870	402	163	295	194	123	72	36	16,640	
All species groups	44,957	44,959	29,841	20,051	12,260	6,510	4,008	2,015	1,033	284	72	36	166,026	

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the number of trees rounds to less than 1 thousand trees. Columns and rows may not add to their totals due to rounding.

Table SD-12.—Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, by owner class and forest-land status, South Dakota, 2010

Owner class	Unreserved forests		Reserved forests		All forest land
	Timberland	Unproductive	Productive	Unproductive	
Forest Service					
National forest	1,365.4	3.5	1,368.9	28.8	1,397.7
Other Federal					
National Park Service	--	--	--	--	14.2
Bureau of Land Management	20.8	--	20.8	--	20.8
State and local government					
State	93.7	--	93.7	--	93.7
Local (county, municipal, etc.)	5.0	--	5.0	--	5.0
Private					
Undifferentiated private	701.7	52.9	754.6	--	754.6
All owners	2,186.6	56.4	2,243.0	43.0	2,286.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-13.—Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by forest-type group, forest type, and stand-size class, South Dakota, 2010

Forest-type group/ forest type	Large diameter	Medium diameter	Small diameter	Nonstocked	All size classes
Softwood type groups					
White / red / jack pine group					
Red pine	--	5.5	--	--	5.5
Total	--	5.5	--	--	5.5
Spruce / fir group					
White spruce	91.0	7.0	--	--	97.9
Total	91.0	7.0	--	--	97.9
Other eastern softwoods group					
Eastern redcedar	4.4	1.5	5.9	--	11.8
Total	4.4	1.5	5.9	--	11.8
Pinyon / juniper group					
Rocky Mountain juniper	17.4	6.7	6.1	--	30.1
Total	17.4	6.7	6.1	--	30.1
Ponderosa pine group					
Ponderosa pine	1,518.2	107.9	49.7	--	1,675.8
Total	1,518.2	107.9	49.7	--	1,675.8
All softwood groups					
	3,261.7	251.6	123.4	--	3,636.7
Hardwood type groups					
Oak / pine group					
Eastern redcedar / hardwood	--	--	2.1	--	2.1
Total	--	--	2.1	--	2.1
Oak / hickory group					
Bur oak	55.1	44.1	1.2	--	100.4
Elm / ash / black locust	9.9	23.9	1.1	--	35.0
Mixed upland hardwoods	6.6	5.9	--	--	12.5
Total	71.7	73.9	2.3	--	147.8
Elm / ash / cottonwood group					
Cottonwood	95.3	1.4	--	--	96.7
Sugarberry / hackberry / elm / green ash	121.1	5.9	1.8	--	128.8
Cottonwood / willow	12.0	--	--	--	12.0
Total	228.4	7.4	1.8	--	237.5
Maple / beech / birch group					
Sugar maple / beech / yellow birch	8.2	--	--	--	8.2
Total	8.2	--	--	--	8.2
Aspen / birch group					
Aspen	3.2	9.6	21.8	--	34.6
Paper birch	--	--	4.2	--	4.2
Total	3.2	9.6	26.0	--	38.8
Other hardwoods group					
Other hardwoods	--	0.7	8.6	--	9.3
Total	--	0.7	8.6	--	9.3
Exotic hardwoods group					
Other exotic hardwoods	4.7	8.3	--	--	13.0
Total	4.7	8.3	--	--	13.0
All hardwood groups					
	632.4	199.6	79.4	--	911.4
Nonstocked	--	--	--	8.1	8.1
All forest groups	1,947.1	228.4	102.4	8.1	2,286.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-14.—Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Eastern white and red pines					
Red pine	--	--	--	5.5	5.5
Total	--	--	--	5.5	5.5
Spruce and balsam fir					
White spruce	67.7	7.3	--	6.4	81.3
Total	67.7	7.3	--	6.4	81.3
Other eastern softwoods					
Eastern redcedar	--	--	0.1	15.2	15.3
Ponderosa pine	1,300.6	25.5	67.3	345.6	1,739.0
Total	1,300.6	25.5	67.4	360.8	1,754.3
Woodland softwoods					
Rocky Mountain juniper	5.3	1.2	1.1	18.0	25.6
Total	5.3	1.2	1.1	18.0	25.6
Total softwoods	1,373.6	33.9	68.5	390.7	1,866.7
Hardwood species groups					
Select white oaks					
Bur oak	5.0	--	2.0	89.0	96.0
Total	5.0	--	2.0	89.0	96.0
Soft maple					
Silver maple	--	--	--	3.4	3.4
Total	--	--	--	3.4	3.4
Ash					
Green ash	0.3	--	8.0	74.7	83.0
Total	0.3	--	8.0	74.7	83.0
Cottonwood and aspen					
Eastern cottonwood	--	--	--	52.7	52.7
Plains cottonwood	--	--	18.7	27.6	46.3
Quaking aspen	16.6	0.7	--	1.7	19.0
Total	16.6	0.7	18.7	82.1	118.0
Basswood					
American basswood	--	--	--	0.9	0.9
Total	--	--	--	0.9	0.9
Black walnut					
Black walnut	--	--	--	1.7	1.7
Total	--	--	--	1.7	1.7
Other eastern soft hardwoods					
Boxelder	--	--	--	29.6	29.6
Paper birch	1.7	0.4	0.1	0.1	2.3
Hackberry	--	--	--	6.8	6.8
White willow	--	--	--	4.7	4.7
American elm	0.3	--	0.7	52.9	53.9
Siberian elm	--	--	--	13.6	13.6
Slippery elm	--	--	--	0.2	0.2
Total	2.0	0.4	0.8	108.0	111.2

(Table SD-14 continued on next page)

(Table SD-14 continued)

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Other eastern hard hardwoods					
Honeylocust	--	--	--	1.1	1.1
Red mulberry	--	--	0.7	0.4	1.1
Total	--	--	0.7	1.5	2.2
Eastern noncommercial hardwoods					
Prairie crab apple	--	--	--	0.7	0.7
Eastern hophornbeam	0.2	--	--	0.7	0.9
Chokecherry	--	--	--	0.1	0.1
Willow spp.	--	--	--	0.0	0.0
Russian-olive	--	--	--	1.1	1.1
Other or unknown live tree	--	--	--	0.1	0.1
Total	0.2	--	--	2.7	2.9
Total hardwoods	24.1	1.1	30.2	363.9	419.2
All species groups	1,397.7	35.0	98.7	754.6	2,286.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-15.—Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)													All classes
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0- 36.9	37.0+	
Softwood wood species groups														
Eastern white and red pines														
Red pine	3	3	0	--	--	--	--	--	--	--	--	--	--	5
Total	3	3	0	--	--	--	--	--	--	--	--	--	--	5
Spruce and balsam fir														
White spruce	5	9	11	11	17	15	7	4	2	--	--	--	--	81
Total	5	9	11	11	17	15	7	4	2	--	--	--	--	81
Other eastern softwoods														
Eastern redcedar	3	4	5	3	1	--	--	--	--	--	--	--	--	15
Ponderosa pine	67	191	273	300	279	215	189	108	81	28	7	--	--	1,739
Total	69	195	278	303	280	215	189	108	81	28	7	--	--	1,754
Woodland softwoods														
Rocky Mountain juniper	3	5	5	3	2	3	1	--	1	3	--	--	--	26
Total	3	5	5	3	2	3	1	--	1	3	--	--	--	26
Total softwoods	80	213	294	317	299	233	196	112	84	31	7	--	--	1,867
Hardwood species groups														
Select white oaks														
Bur oak	15	19	11	14	10	8	7	3	10	--	--	--	--	96
Total	15	19	11	14	10	8	7	3	10	--	--	--	--	96
Soft maple														
Silver maple	0	0	1	0	1	1	--	--	--	--	--	--	--	3
Total	0	0	1	0	1	1	--	--	--	--	--	--	--	3
Ash														
Green ash	6	11	9	12	10	8	8	8	2	8	--	--	--	83
Total	6	11	9	12	10	8	8	8	2	8	--	--	--	83
Cottonwood and aspen														
Eastern cottonwood	1	2	1	2	3	6	1	6	3	11	18	--	--	53
Plains cottonwood	--	--	1	--	3	3	4	4	8	5	--	7	11	46
Quaking aspen	4	8	4	2	0	--	--	--	--	--	--	--	--	19
Total	5	10	6	4	7	8	6	10	11	15	18	7	11	118
Basswood														
American basswood	0	0	0	--	--	--	--	--	--	--	--	--	--	1
Total	0	0	0	--	--	--	--	--	--	--	--	--	--	1
Black walnut														
Black walnut	0	0	0	1	--	--	--	--	--	--	--	--	--	2
Total	0	0	0	1	--	--	--	--	--	--	--	--	--	2
Other eastern soft hardwoods														
Boxelder	2	2	4	6	4	3	3	1	5	--	--	--	--	30
Paper birch	1	1	--	--	--	--	--	--	--	--	--	--	--	2
Hackberry	0	1	2	3	2	--	--	--	--	--	--	--	--	7
White willow	--	--	--	--	--	--	--	--	--	5	--	--	--	5
American elm	3	6	6	5	4	1	4	6	14	5	--	--	--	54
Siberian elm	1	3	4	3	3	--	--	--	--	--	--	--	--	14
Slippery elm	--	0	--	--	--	--	--	--	--	--	--	--	--	0
Total	8	12	15	16	12	4	7	8	19	10	--	--	--	111

(Table SD-15 continued on next page)

(Table SD-15 continued)

Species group/ species	Diameter class (inches)														All classes
	1.0- 2.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0- 36.9	37.0+		
Other eastern hard hardwoods															
Honeylocust	0	1	0	--	--	--	--	--	--	--	--	--	--	--	1
Red mulberry	1	0	0	--	--	--	--	--	--	--	--	--	--	--	1
Total	1	1	1	--	--	--	--	--	--	--	--	--	--	--	2
Eastern noncommercial hardwoods															
Prairie crab apple	0	0	0	--	--	--	--	--	--	--	--	--	--	--	1
Eastern hophornbeam	1	0	--	--	--	--	--	--	--	--	--	--	--	--	1
Chokecherry	0	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Willow spp.	0	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Russian-olive	0	0	--	0	--	--	--	--	--	--	--	--	--	--	1
Other or unknown live tree	0	--	--	--	--	--	--	--	--	--	--	--	--	--	0
Total	2	1	0	0	--	--	--	--	--	--	--	--	--	--	3
Total hardwoods	36	53	44	48	40	30	27	30	41	34	18	7	11	419	
All species groups	117	266	338	365	340	263	223	141	126	65	25	7	11	2,286	

All table cells without observations in the inventory sample are indicated by "--". Table value of 0 indicates the volume rounds to less

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the volume rounds to less than 1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-16.—Net volume of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by forest-type group, forest type, and stand origin, South Dakota, 2010

Forest-type group/ forest type	Stand origin		All forest land
	Natural stands	Artificial regeneration	
Softwood type groups			
White / red / jack pine group			
Red pine	--	5.5	5.5
Total	--	5.5	5.5
Spruce / fir group			
White spruce	97.9	--	97.9
Total	97.9	--	97.9
Other eastern softwoods group			
Eastern redcedar	10.3	1.5	11.8
Total	10.3	1.5	11.8
Pinyon / juniper group			
Rocky Mountain juniper	30.1	--	30.1
Total	30.1	--	30.1
Ponderosa pine group			
Ponderosa pine	1,668.9	6.9	1,675.8
Total	1,668.9	6.9	1,675.8
All softwood groups			
Hardwood type groups			
Oak / pine group			
Eastern redcedar / hardwood	2.1	--	2.1
Total	2.1	--	2.1
Oak / hickory group			
Bur oak	100.4	--	100.4
Elm / ash / black locust	35.0	--	35.0
Mixed upland hardwoods	12.5	--	12.5
Total	147.8	--	147.8
Elm / ash / cottonwood group			
Cottonwood	96.7	--	96.7
Sugarberry / hackberry / elm / green ash	108.2	20.6	128.8
Cottonwood / willow	12.0	--	12.0
Total	217.0	20.6	237.5
Maple / beech / birch group			
Sugar maple / beech / yellow birch	8.2	--	8.2
Total	8.2	--	8.2
Aspen / birch group			
Aspen	34.6	--	34.6
Paper birch	4.2	--	4.2
Total	38.8	--	38.8
Other hardwoods group			
Other hardwoods	9.3	--	9.3
Total	9.3	--	9.3
Exotic hardwoods group			
Other exotic hardwoods	6.0	7.0	13.0
Total	6.0	7.0	13.0
All hardwood groups			
Nonstocked	429.2	27.6	456.8
Total	8.1	--	8.1
All forest groups			
	2,244.5	41.4	2,286.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-17.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, on timberland by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)														All classes	
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0+				
Softwood wood species groups																
Eastern white and red pines																
Red pine	2	2	0	--	--	--	--	--	--	--	--	--	5			
Total	2	2	0	--	--	--	--	--	--	--	--	--	5			
Spruce and balsam fir																
White spruce	5	9	11	10	12	15	5	4	2	--	--	--	74			
Total	5	9	11	10	12	15	5	4	2	--	--	--	74			
Other eastern softwoods																
Eastern redcedar	1	2	3	2	1	--	--	--	--	--	--	--	9			
Ponderosa pine	59	181	256	285	267	201	179	107	71	26	--	--	1,632			
Total	60	183	259	287	268	201	179	107	71	26	--	--	1,641			
Total softwoods	68	195	269	298	280	216	185	111	73	26	--	--	1,720			
Hardwood species groups																
Select white oaks																
Bur oak	3	4	3	6	4	1	2	--	--	--	--	--	22			
Total	3	4	3	6	4	1	2	--	--	--	--	--	22			
Soft maple																
Silver maple	--	--	0	--	--	--	--	--	--	--	--	--	0			
Total	--	--	0	--	--	--	--	--	--	--	--	--	0			
Ash																
Green ash	2	5	3	6	7	2	2	2	--	3	--	--	32			
Total	2	5	3	6	7	2	2	2	--	3	--	--	32			
Cottonwood and aspen																
Eastern cottonwood	0	1	1	1	2	6	1	6	3	11	11	--	43			
Plains cottonwood	--	--	0	--	3	3	--	4	8	--	--	7	26			
Quaking aspen	3	5	3	1	--	--	--	--	--	--	12	--	12			
Total	3	6	5	2	5	8	1	10	11	11	11	7	81			
Basswood																
American basswood	0	--	0	--	--	--	--	--	--	--	--	--	1			
Total	0	--	0	--	--	--	--	--	--	--	--	--	1			
Black walnut																
Black walnut	0	0	--	1	--	--	--	--	--	--	--	--	1			
Total	0	0	--	1	--	--	--	--	--	--	--	--	1			
Other eastern soft hardwoods																
Boxelder	--	0	1	0	1	--	--	--	--	--	--	--	2			
Paper birch	1	1	--	--	--	--	--	--	--	--	--	--	2			
Hackberry	0	0	1	2	--	--	--	--	--	--	--	--	4			
American elm	2	3	3	2	2	1	2	4	4	--	--	--	23			
Siberian elm	0	1	2	1	--	--	--	--	--	--	--	--	4			
Total	3	5	6	5	3	1	2	4	4	--	--	--	34			
Other eastern hard hardwoods																
Honeylocust	0	1	0	--	--	--	--	--	--	--	--	--	1			
Red mulberry	0	0	--	--	--	--	--	--	--	--	--	--	0			
Total	1	1	0	--	--	--	--	--	--	--	--	--	1			
Total hardwoods	13	21	19	20	18	12	6	16	15	14	11	7	173			
All species groups	81	216	288	318	298	228	191	127	88	40	11	7	1,892			

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the volume rounds to less than 1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-18.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, on timberland by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Eastern white and red pines					
Red pine	--	--	--	4.7	4.7
Total	--	--	--	4.7	4.7
Spruce and balsam fir					
White spruce	60.0	7.3	--	6.4	73.7
Total	60.0	7.3	--	6.4	73.7
Other eastern softwoods					
Eastern redcedar	--	--	0.1	9.3	9.4
Ponderosa pine	1,239.9	11.2	67.0	313.7	1,631.8
Total	1,239.9	11.2	67.1	323.0	1,641.2
Total softwoods	1,299.9	18.4	67.1	334.1	1,719.6
Hardwood species groups					
Select white oaks					
Bur oak	3.8	--	0.6	17.9	22.4
Total	3.8	--	0.6	17.9	22.4
Soft maple					
Silver maple	--	--	--	0.4	0.4
Total	--	--	--	0.4	0.4
Ash					
Green ash	0.1	--	1.3	30.4	31.8
All species	0.1	--	1.3	30.4	31.8
Cottonwood and aspen					
Eastern cottonwood	--	--	--	43.2	43.2
Plains cottonwood	--	--	17.5	8.4	25.9
Quaking aspen	10.5	0.3	--	1.5	12.2
Total	10.5	0.3	17.5	53.1	81.4
Basswood					
American basswood	--	--	--	0.6	0.6
Total	--	--	--	0.6	0.6
Black walnut					
Black walnut	--	--	--	0.8	0.8
Total	--	--	--	0.8	0.8
Other eastern soft hardwoods					
Boxelder	--	--	--	1.9	1.9
Paper birch	1.4	0.4	0.1	--	1.9
Hackberry	--	--	--	3.6	3.6
American elm	0.1	--	0.5	22.5	23.2
Siberian elm	--	--	--	3.6	3.6
Total	1.5	0.4	0.6	31.5	34.0
Other eastern hard hardwoods					
Honeylocust	--	--	--	1.1	1.1
Red mulberry	--	--	--	0.4	0.4
Total	--	--	--	1.5	1.5
Total hardwoods	31.8	1.3	39.9	271.1	344.3
All species groups	1,315.8	19.1	87.1	470.4	1,892.5

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-19.—Net volume of sawtimber trees, in million board feet (International ¼-inch rule), on timberland by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0+		
Softwood wood species groups												
Eastern white and red pines												
Red pine	1	--	--	--	--	--	--	--	--	--	1	--
Total	1	--	--	--	--	--	--	--	--	--	1	--
Spruce and balsam fir												
White spruce	44	44	52	63	22	16	9	--	--	--	250	--
Total	44	44	52	63	22	16	9	--	--	--	250	--
Other eastern softwoods												
Eastern redcedar	15	12	4	--	--	--	--	--	--	--	31	--
Ponderosa pine	640	1,096	1,203	1,002	953	595	408	153	--	--	6,049	--
Total	655	1,108	1,207	1,002	953	595	408	153	--	--	6,080	--
Total softwoods	701	1,152	1,259	1,065	975	610	416	153	--	--	6,332	--
Hardwood species groups												
Select white oaks												
Bur oak	--	28	18	4	7	--	--	--	--	--	58	--
Total	--	28	18	4	7	--	--	--	--	--	58	--
Ash												
Green ash	--	24	30	9	8	8	--	18	--	--	96	--
Total	--	24	30	9	8	8	--	18	--	--	96	--
Cottonwood and aspen												
Eastern cottonwood	--	5	9	26	7	29	15	55	56	--	201	--
Plains cottonwood	--	--	12	12	--	21	41	--	--	36	123	--
Quaking aspen	--	4	--	--	--	--	--	--	--	--	4	--
Total	--	10	21	38	7	50	56	55	56	36	329	--
Black walnut												
Black walnut	--	2	--	--	--	--	--	--	--	--	2	--
Total	--	2	--	--	--	--	--	--	--	--	2	--
Other eastern soft hardwoods												
Boxelder	--	2	3	--	--	--	--	--	--	--	4	--
Hackberry	--	7	--	--	--	--	--	--	--	--	7	--
American elm	--	10	10	5	8	18	18	--	--	--	69	--
Siberian elm	--	4	--	--	--	--	--	--	--	--	4	--
Total	--	23	12	5	8	18	18	--	--	--	84	--
Total hardwoods	--	87	81	56	30	76	74	72	56	36	569	--
All species groups	701	1,239	1,341	1,122	1,005	686	490	225	56	36	6,901	--

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the volume rounds to less than 1 million board feet. Columns and rows may not add to their totals due to rounding.

Table SD-19a.—Net volume of sawtimber trees, in million board feet (Scribner rule) on timberland by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)											All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 24.9	25.0- 28.9	29.0- 32.9	33.0+		
Softwood wood species groups												
Eastern white and red pines												
Red pine	1	--	--	--	--	--	--	--	--	--	--	1
Total	1	--	--	--	--	--	--	--	--	--	--	1
Spruce and balsam fir												
White spruce	35	36	45	55	20	14	8	--	--	--	--	213
Total	35	36	45	55	20	14	8	--	--	--	--	213
Other eastern softwoods												
Eastern redcedar	12	10	4	--	--	--	--	--	--	--	--	25
Ponderosa pine	501	908	1,032	880	852	540	375	142	--	--	--	5,231
Total	513	918	1,035	880	852	540	375	142	--	--	--	5,256
Total softwoods	549	954	1,080	936	872	554	383	142	--	--	--	5,471
Hardwood species groups												
Select white oaks												
Bur oak	--	23	16	4	7	--	--	--	--	--	--	49
Total	--	23	16	4	7	--	--	--	--	--	--	49
Ash												
Green ash	--	20	26	8	7	7	--	17	--	--	--	85
Total	--	20	26	8	7	7	--	17	--	--	--	85
Cottonwood and aspen												
Eastern cottonwood	--	4	8	23	6	26	14	52	32	21	--	186
Plains cottonwood	--	--	10	11	--	20	38	--	--	--	--	79
Quaking aspen	--	4	--	--	--	--	--	--	--	--	--	4
Total	--	8	18	33	6	46	52	52	32	21	--	268
Black walnut												
Black walnut	--	2	--	--	--	--	--	--	--	--	--	2
Total	--	2	--	--	--	--	--	--	--	--	--	2
Other eastern soft hardwoods												
Boxelder	--	1	2	--	--	--	--	--	--	--	--	4
Hackberry	--	6	--	--	--	--	--	--	--	--	--	6
American elm	--	9	8	4	7	16	17	--	--	--	--	62
Siberian elm	--	3	--	--	--	--	--	--	--	--	--	3
Total	--	19	11	4	7	16	17	--	--	--	--	74
Total hardwoods	--	72	70	50	27	70	68	68	32	21	--	479
All species groups	549	1,027	1,150	985	900	624	451	211	32	21	--	5,949

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the volume rounds to less than 1 million board feet. Columns and rows may not add to their totals due to rounding.

Table SD-20.—Net volume of saw log portion of sawtimber trees, in million cubic feet, on timberland by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Eastern white and red pines					
Red pine	--	--	--	0.2	0.2
Total	--	--	--	0.2	0.2
Spruce and balsam fir					
White spruce	42.2	4.6	--	5.6	52.4
Total	42.2	4.6	--	5.6	52.4
Other eastern softwoods					
Eastern redcedar	--	--	--	5.1	5.1
Ponderosa pine	890.6	9.0	55.0	234.0	1,188.6
Total	890.6	9.0	55.0	239.1	1,193.7
Total softwoods	932.7	13.6	55.0	244.9	1,246.3
Hardwood species groups					
Select white oaks					
Bur oak	1.2	--	--	8.2	9.4
Total	1.2	--	--	8.2	9.4
Ash					
Green ash	0.0	0.0	0.0	0.0	0.0
Total	--	--	0.6	16.9	17.4
Cottonwood and aspen					
Eastern cottonwood	--	--	--	38.8	38.8
Plains cottonwood	--	--	15.9	8.1	24.1
Quaking aspen	0.7	--	--	--	0.7
Total	0.7	--	15.9	46.9	63.5
Black walnut					
Black walnut	--	--	--	0.4	0.4
Total	--	--	--	0.4	0.4
Other eastern soft hardwoods					
Boxelder	--	--	--	0.7	0.7
Hackberry	--	--	--	1.0	1.0
American elm	--	--	--	13.3	13.3
Siberian elm	--	--	--	0.6	0.6
Total	--	--	--	15.7	15.7
Total hardwoods	1.8	--	16.5	88.1	106.4
All species groups	934.6	13.6	71.5	333.0	1,352.7

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-21.—Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, by owner class and forest-land status, South Dakota, 2010

Owner class	Unreserved forests			Reserved forests			All forest land
	Timberland	Unproductive	Total	Productive	Unproductive	Total	
Forest Service							
National forest	15.1	0.1	15.2	-1.2	--	-1.2	13.9
Other Federal							
National Park Service	--	--	--	0.1	--	0.1	0.1
Bureau of Land Management	0.3	--	0.3	--	--	--	0.3
Fish and Wildlife Service	0.0	--	0.0	--	--	--	0.0
State and local government							
State	1.4	0.0	1.4	--	--	--	1.4
Private							
Undifferentiated private	20.2	4.2	24.4	--	--	--	24.4
All owners	37.0	4.3	41.3	-1.2	--	-1.2	40.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-22.—Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by forest-type group, forest type, and stand-size class, South Dakota, 2010

Forest-type group/ forest type	Stand-size class			All stands
	Large diameter	Medium diameter	Small diameter	
Softwood type groups				
White / red / jack pine group				
Red pine	--	1.0	--	1.0
Total	--	1.0	--	1.0
Spruce / fir group				
White spruce	1.3	0.0	0.0	1.3
Total	1.3	0.0	0.0	1.3
Other eastern softwoods group				
Eastern redcedar	0.2	0.4	0.6	1.1
Total	0.2	0.4	0.6	1.1
Pinyon / juniper group				
Rocky Mountain juniper	1.2	0.3	0.2	1.6
Total	1.2	0.3	0.2	1.6
Ponderosa pine group				
Ponderosa pine	17.6	-0.3	2.7	20.0
Total	17.6	-0.3	2.7	20.0
All softwood groups				
Total	20.2	1.4	3.4	25.0
Hardwood type groups				
Oak / hickory group				
Bur oak	1.7	2.2	0.3	4.3
Elm / ash / black locust	0.0	1.1	0.6	1.8
Mixed upland hardwoods	0.0	1.2	--	1.3
Total	1.8	4.6	0.9	7.3
Elm / ash / cottonwood group				
Black ash/ American elm / red maple	--	0.0	--	0.0
Cottonwood	2.6	0.5	--	3.1
Sugarberry / hackberry / elm / green ash	0.2	1.3	0.0	1.5
Cottonwood / willow	-0.1	--	--	-0.1
Total	2.7	1.9	0.0	4.6
Maple / beech / birch group				
Sugar maple / beech / yellow birch	1.5	0.0	--	1.5
Total	1.5	0.0	--	1.5
Aspen / birch group				
Aspen	0.1	-0.4	0.1	-0.2
Total	0.1	-0.4	0.1	-0.2
Other hardwoods group				
Other hardwoods	--	0.1	0.0	0.1
Total	--	0.1	0.0	0.1
Exotic hardwoods group				
Other exotic hardwoods	0.9	0.2	--	1.1
Total	0.9	0.2	--	1.1
All hardwood groups				
Total	7.1	6.3	1.0	14.4
Nonstocked				
Total	--	--	--	0.7
All forest groups				
Total	27.3	7.7	4.4	40.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-23.—Average annual net growth of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by species group, species, and ownership group, South Dakota, 2010

Species group/ Species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Eastern white and red pines					
Red pine	--	--	--	1.0	1.0
Total	--	--	--	1.0	1.0
Spruce and balsam fir					
White spruce	1.2	0.2	--	0.1	1.5
Total	1.2	0.2	--	0.1	1.5
Other eastern softwoods					
Eastern redcedar	--	0.0	0.0	1.3	1.3
Ponderosa pine	13.3	0.3	-0.1	9.3	22.9
Total	13.3	0.4	-0.1	10.5	24.1
Woodland softwoods					
Rocky Mountain juniper	0.4	-0.1	0.0	1.4	1.7
Total	0.4	-0.1	0.0	1.4	1.7
Total softwoods	15.0	0.5	-0.1	13.0	28.3
Hardwood species groups					
Select white oaks					
Bur oak	0.1	--	--	2.8	2.9
Total	0.1	--	--	2.8	2.9
Soft maple					
Silver maple	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1
Ash					
Green ash	0.0	--	1.2	1.7	2.8
Total	0.0	--	1.2	1.7	2.8
Cottonwood and aspen					
Eastern cottonwood	--	--	--	2.3	2.3
Plains cottonwood	--	--	0.4	0.2	0.5
Quaking aspen	-1.1	-0.1	--	-0.1	-1.3
Total	-1.1	-0.1	0.4	2.4	1.6
Basswood					
American basswood	--	--	--	0.0	0.0
Total	--	--	--	0.0	0.0
Black walnut					
Black walnut	--	--	--	0.3	0.3
Total	--	--	--	0.3	0.3
Other eastern soft hardwoods					
Boxelder	--	--	0.0	0.2	0.2
Paper birch	0.0	0.0	0.0	0.0	0.0
Hackberry	--	--	0.0	0.4	0.4
White willow	--	--	--	0.1	0.1
American elm	0.0	--	-0.1	1.9	1.8
Siberian elm	--	--	--	1.1	1.1
Slippery elm	--	--	--	0.0	0.0
Total	0.0	0.0	0.0	3.7	3.7

(Table SD-23 continued on next page)

(Table SD-23 continued)

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Other eastern hard hardwoods					
Honeylocust	--	--	--	0.2	0.2
Red mulberry	--	--	0.0	0.1	0.1
Total	--	--	0.0	0.3	0.3
Eastern noncommercial hardwoods					
Prairie crab apple	--	--	--	0.1	0.1
Eastern hophornbeam	0.0	--	--	0.0	0.0
Chokecherry	--	--	--	0.0	0.0
Willow spp.	--	--	--	0.0	0.0
Russian-olive	--	--	--	0.1	0.1
Other or unknown live tree	--	--	--	0.0	0.0
Total	0.0	--	--	0.2	0.2
Total hardwoods	-1.0	-0.1	1.5	11.4	11.8
All species groups	13.9	0.4	1.4	24.4	40.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-24.—Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, on timberland by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Eastern white and red pines					
Red pine	--	--	--	0.9	0.9
Total	--	--	--	0.9	0.9
Spruce and balsam fir					
White spruce	1.1	0.2	--	0.1	1.3
Total	1.1	0.2	--	0.1	1.3
Other eastern softwoods					
Eastern redcedar	--	0.0	0.0	0.5	0.5
Ponderosa pine	20.6	0.6	0.0	8.7	30.0
Total	20.6	0.6	0.0	9.2	30.5
Total softwoods	21.7	0.8	0.0	10.2	32.7
Hardwood species groups					
Select white oaks					
Bur oak	0.1	--	--	0.2	0.3
Total	0.1	--	--	0.2	0.3
Ash					
Green ash	0.0	--	0.0	1.3	1.4
Total	0.0	--	0.0	1.3	1.4
Cottonwood and aspen					
Eastern cottonwood	--	--	--	2.1	2.1
Plains cottonwood	--	--	0.1	0.9	0.9
Quaking aspen	-0.9	-0.1	--	-0.1	-1.0
Total	-0.9	-0.1	0.1	2.8	2.0
Basswood					
American basswood	--	--	--	0.0	0.0
Total	--	--	--	0.0	0.0
Black walnut					
Black walnut	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1
Other eastern soft hardwoods					
Boxelder	--	--	--	0.2	0.2
Paper birch	0.0	0.0	0.0	0.0	0.0
Hackberry	--	--	0.0	0.1	0.1
American elm	0.0	--	0.1	1.1	1.1
Siberian elm	--	--	--	0.1	0.1
Total	0.0	0.0	0.1	1.5	1.6
Other eastern hard hardwoods					
Honeylocust	--	--	--	0.2	0.2
Red mulberry	--	--	--	0.1	0.1
Total	--	--	--	0.3	0.3
Total hardwoods	-0.8	0.0	0.2	6.2	5.6
All species groups	20.9	0.8	0.2	16.4	38.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-25.—Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, by owner class and forest-land status, South Dakota, 2010

Owner class	Unreserved forests		Reserved forests		All forest land
	Timberland	Unproductive	Productive	Unproductive	
Forest Service					
National forest	15.6	0.1	15.6	2.4	18.0
Other Federal					
National Park Service	--	--	--	--	0.0
Bureau of Land Management	0.1	--	0.1	--	0.1
State and local government					
State	1.3	0.0	1.4	--	1.4
Private					
Undifferentiated private	9.9	0.4	10.3	--	10.3
All owners	26.9	0.5	27.4	2.4	29.8

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-26.—Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by forest-type group, forest type, and stand-size class, South Dakota, 2010

Forest-type group/ forest type	Stand-size class			Nonstocked	All stands
	Large diameter	Medium diameter	Small diameter		
Softwood type groups					
Spruce / fir group					
White spruce	0.8	0.1	0.1	--	1.0
Total	0.8	0.1	0.1	--	1.0
Pinyon / juniper group					
Rocky Mountain juniper	--	0.1	--	--	0.1
Total	--	0.1	--	--	0.1
Ponderosa pine group					
Ponderosa pine	16.5	3.9	0.2	--	20.6
Total	16.5	3.9	0.2	--	20.6
All softwood groups					
	17.3	4.1	0.3	--	21.7
Hardwood type groups					
Oak / hickory group					
Bur oak	0.2	0.3	--	--	0.6
Elm / ash / black locust	0.9	0.3	--	--	1.2
Total	1.1	0.6	--	--	1.8
Elm / ash / cottonwood group					
Black ash/ American elm / red maple	--	0.0	--	--	0.0
Cottonwood	1.2	0.0	--	--	1.2
Sugarberry / hackberry / elm / green ash	2.9	0.4	0.0	--	3.3
Cottonwood / willow	0.3	--	--	--	0.3
Total	4.3	0.4	0.0	--	4.7
Maple / beech / birch group					
Sugar maple / beech / yellow birch	--	0.1	--	--	0.1
Total	--	0.1	--	--	0.1
Aspen / birch group					
Aspen	--	1.0	0.0	--	1.1
Total	--	1.0	0.0	--	1.1
Other hardwoods group					
Other hardwoods	--	--	0.1	--	0.1
Total	--	--	0.1	--	0.1
Exotic hardwoods group					
Other exotic hardwoods	--	0.4	--	--	0.4
Total	--	0.4	--	--	0.4
All hardwood groups					
	5.4	2.5	0.1	--	8.1
Nonstocked					
	--	--	--	0.1	0.1
All forest groups					
	22.8	6.5	0.4	0.1	29.8

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-27.—Average annual mortality of trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Spruce and balsam fir					
White spruce	1.0	0.0	--	--	1.0
Total	1.0	0.0	--	--	1.0
Other eastern softwoods					
Ponderosa pine	15.5	0.0	1.2	3.3	19.9
Total	15.5	0.0	1.2	3.3	19.9
Woodland softwoods					
Rocky Mountain juniper	--	--	--	0.0	0.0
Total	--	--	--	0.0	0.0
Total softwoods	16.4	0.1	1.2	3.3	20.9
Hardwood species groups					
Select white oaks					
Bur oak	--	--	--	1.3	1.3
Total	--	--	--	1.3	1.3
Soft maple					
Silver maple	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1
Ash					
Green ash	--	--	--	1.5	1.5
Total	--	--	--	1.5	1.5
Cottonwood and aspen					
Eastern cottonwood	--	--	--	0.5	0.5
Plains cottonwood	--	--	--	0.5	0.5
Quaking aspen	1.5	0.1	--	0.2	1.7
Total	1.5	0.1	--	1.1	2.7
Other eastern soft hardwoods					
Boxelder	--	--	--	1.2	1.2
Paper birch	0.1	--	--	0.0	0.1
Hackberry	--	--	--	0.1	0.1
American elm	--	--	0.2	1.5	1.6
Siberian elm	--	--	--	0.2	0.2
Total	0.1	--	0.2	3.0	3.3
Other eastern hard hardwoods					
Red mulberry	--	--	0.0	--	0.0
Total	--	--	0.0	--	0.0
Eastern noncommercial hardwoods					
Eastern hophornbeam	0.0	--	--	0.0	0.0
Willow spp.	--	--	--	0.0	0.0
Total	0.0	--	--	0.1	0.1
Total hardwoods	1.6	0.1	0.2	7.0	8.9
All species groups	18.0	0.1	1.4	10.3	29.8

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-28.—Average annual mortality of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, on timberland by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Spruce and balsam fir					
White spruce	1.0	0.0	--	--	1.0
Total	1.0	0.0	--	--	1.0
Other eastern softwoods					
Ponderosa pine	12.6	--	1.2	3.2	17.0
Total	12.6	--	1.2	3.2	17.0
Total softwoods	13.5	0.0	1.2	3.2	18.0
Hardwood species groups					
Select white oaks					
Bur oak	--	0.0	--	0.9	1.0
Total	--	0.0	--	0.9	1.0
Ash					
Green ash	--	--	--	0.8	0.8
Total	--	--	--	0.8	0.8
Cottonwood and aspen					
Eastern cottonwood	0.0	0.0	--	0.5	0.5
Plains cottonwood	0.0	0.0	--	0.5	0.5
Quaking aspen	1.2	0.1	--	0.2	1.4
Total	1.2	0.1	--	1.1	2.4
Other eastern soft hardwoods					
Paper birch	0.1	--	--	0.0	0.1
American elm	0.0	--	--	0.5	0.5
Siberian elm	0.0	--	--	0.1	0.1
Total	0.1	--	--	0.6	0.7
Total hardwoods	1.2	0.1	-	3.5	4.8
All species groups	12.8	0.1	1.2	6.7	22.8

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-29.—Average annual removals of live trees (at least 5 inches d.b.h./d.r.c.), in million cubic feet, on forest land by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Spruce and balsam fir					
White spruce	1.7	--	--	--	1.7
Total	1.7	--	--	--	1.7
Other eastern softwoods					
Eastern redcedar	--	--	--	0.3	0.3
Ponderosa pine	17.1	--	0.9	5.6	23.6
Total	17.1	--	0.9	5.9	23.9
Total softwoods	18.8	--	0.9	5.9	25.6
Hardwood species groups					
Select white oaks					
Bur oak	--	--	--	0.5	0.5
Total	--	--	--	0.5	0.5
Ash					
Green ash	--	--	--	0.3	0.3
Total	--	--	--	0.3	0.3
Cottonwood and aspen					
Quaking aspen	0.0	--	--	--	0.0
Total	0.0	--	--	--	0.0
Other eastern soft hardwoods					
Boxelder	--	--	--	0.0	0.0
American elm	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1
Total hardwoods	0.0	--	--	0.9	0.9
All species groups	18.8	--	0.9	6.7	26.5

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-30.—Average annual removals of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, on timberland by species group, species, and ownership group, South Dakota, 2010

Species group/ species	Ownership group				All owners
	Forest Service	Other Federal	State and local government	Undifferentiated private	
Softwood wood species groups					
Spruce and balsam fir					
White spruce	1.7	--	--	--	1.7
Total	1.7	--	--	--	1.7
Other eastern softwoods					
Eastern redcedar	--	0.0	--	0.3	0.3
Ponderosa pine	16.7	--	0.9	5.5	23.1
Total	16.7	0.0	0.9	5.8	23.4
Total softwoods	18.4	0.0	0.9	5.8	25.1
Hardwood species groups					
Ash					
Green ash	--	--	--	0.2	0.2
Total	--	--	--	0.2	0.2
Cottonwood and aspen					
Quaking aspen	0.0	--	--	--	0.0
Total	0.0	--	--	--	0.0
Other eastern soft hardwoods					
Boxelder	--	--	--	0.1	0.1
Total	--	--	--	0.1	0.1
Total hardwoods	0.0	--	--	0.3	0.3
All species groups	18.4	0.0	0.9	6.1	25.5

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic feet. Columns and rows may not add to their totals due to rounding.

Table SD-31.—Aboveground dry weight of live trees (at least 1 inch d.b.h/d.r.c.), in thousand dry short tons, by owner class and forest-land status, South Dakota, 2010

Owner class	Unreserved forests			Reserved forests			All forest land
	Timberland	Unproductive	Total	Productive	Unproductive	Total	
Forest Service							
National forest	25,543	67	25,610	546	--	546	26,156
Other Federal							
National Park Service	--	--	--	292	--	292	292
Bureau of Land Management	399	--	399	--	--	--	399
State and local government							
State	1,749	--	1,749	--	--	--	1,749
Local (county, municipal, etc.)	163	--	163	--	--	--	163
Private							
Undifferentiated private	15,107	1,481	16,587	--	--	--	16,587
All owners	42,961	1,547	44,508	838	--	838	45,346

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the aboveground tree biomass rounds to less than 1 thousand dry tons. Columns and rows may not add to their totals due to rounding.

Table SD-32.—Aboveground dry weight of live trees (at least 1 inch d.b.h/d.r.c.), in thousand dry short tons, on forest land by species group, species, and diameter class, South Dakota, 2010

Species group/ species	Diameter class (inches)																All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
Softwood wood species groups																	
Eastern white and red pines																	
Red pine	--	--	47	46	6	--	--	--	--	--	--	--	--	--	--	--	99
Total	--	--	47	46	6	--	--	--	--	--	--	--	--	--	--	--	99
Spruce and balsam fir																	
White spruce	34	91	90	157	179	184	278	238	106	58	31	--	--	--	--	--	1,445
Total	34	91	90	157	179	184	278	238	106	58	31	--	--	--	--	--	1,445
Other eastern softwoods																	
Eastern redcedar	27	56	53	75	91	60	16	--	--	--	--	--	--	--	--	--	378
Ponderosa pine	177	520	1,261	3,544	4,984	5,428	5,016	3,846	3,367	1,920	771	665	399	102	120	32,122	
Total	204	576	1,313	3,619	5,075	5,488	5,032	3,846	3,367	1,920	771	665	399	102	120	32,500	
Woodland softwoods																	
Rocky Mountain juniper	17	32	43	74	67	35	30	40	9	--	18	--	37	--	--	403	
Total	17	32	43	74	67	35	30	40	9	--	18	--	37	--	--	403	
Total softwoods	255	699	1,494	3,896	5,327	5,707	5,341	4,123	3,482	1,978	820	665	436	102	120	34,447	
Hardwood species groups																	
Select white oaks																	
Bur oak	23	323	485	564	319	378	284	226	173	87	198	62	--	--	--	3,122	
Total	23	323	485	564	319	378	284	226	173	87	198	62	--	--	--	3,122	
Soft maple																	
Silver maple	--	--	3	5	21	10	15	20	--	--	--	--	--	--	--	75	
Total	--	--	3	5	21	10	15	20	--	--	--	--	--	--	--	75	
Ash																	
Green ash	44	88	172	307	260	325	270	223	198	209	--	47	75	137	--	2,356	
All species	44	88	172	307	260	325	270	223	198	209	--	47	75	137	--	2,356	
Cottonwood and aspen																	
Eastern cottonwood	--	8	12	37	23	35	50	102	27	107	--	52	86	101	320	961	
Plains cottonwood	--	--	--	--	12	--	63	47	76	76	143	--	--	83	308	808	
Quaking aspen	45	38	90	152	76	38	8	--	--	--	--	--	--	--	--	447	
Total	45	46	103	189	111	73	121	149	103	184	143	52	86	184	628	2,216	
Basswood																	
American basswood	--	--	8	3	6	--	--	--	--	--	--	--	--	--	--	16	
Total	--	--	8	3	6	--	--	--	--	--	--	--	--	--	--	16	
Black walnut																	
Black walnut	5	--	3	3	12	23	--	--	--	--	--	--	--	--	--	46	
Total	5	--	3	3	12	23	--	--	--	--	--	--	--	--	--	46	
Other eastern soft hardwoods																	
Boxelder	28	39	38	37	91	137	89	61	53	30	91	--	--	--	--	693	
Paper birch	54	80	37	23	--	--	--	--	--	--	--	--	--	--	--	194	
Hackberry	3	--	9	14	40	64	38	--	--	--	--	--	--	--	--	167	
White willow	0	--	--	--	--	--	--	--	--	--	--	--	--	86	--	87	
American elm	1	59	76	143	126	99	86	24	80	131	53	237	--	104	--	1,217	
Siberian elm	--	--	40	82	103	71	66	--	--	--	--	--	--	--	--	362	
Slippery elm	--	--	--	4	--	--	--	--	--	--	--	--	--	--	--	4	
Total	87	178	200	303	359	371	279	85	132	161	143	237	--	190	--	2,725	

(Table SD-32 continued on next page)

(Table SD-32 continued)

Species group/ species	Diameter class (inches)																All classes
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 22.9	23.0- 24.9	25.0- 26.9	27.0- 28.9	29.0+		
Other eastern hard hardwoods																	
Honeylocust	--	--	11	16	7	--	--	--	--	--	--	--	--	--	--	--	34
Red mulberry	1	--	15	8	8	--	--	--	--	--	--	--	--	--	--	--	33
Total	1	--	26	24	16	--	--	--	--	--	--	--	--	--	--	--	67
Eastern noncommercial hardwoods																	
Prairie crab apple	--	--	7	9	7	--	--	--	--	--	--	--	--	--	--	--	23
Eastern hophornbeam	67	75	28	3	--	--	--	--	--	--	--	--	--	--	--	--	174
Chokecherry	21	20	3	--	--	--	--	--	--	--	--	--	--	--	--	--	45
Willow spp.	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	1
Russian-olive	--	--	11	9	--	12	--	--	--	--	--	--	--	--	--	--	32
Other or unknown live tree	--	--	2	--	--	--	--	--	--	--	--	--	--	--	--	--	2
Total	88	95	52	21	7	12	--	--	--	--	--	--	--	--	--	--	276
Total hardwoods	293	731	1,051	1,420	1,112	1,191	970	703	607	640	484	398	161	511	628		10,899
All species groups	548	1,430	2,545	5,316	6,439	6,898	6,311	4,827	4,089	2,618	1,304	1,063	597	613	749		45,346

All table cells without observations in the inventory sample are indicated by --. Table value of 0 indicates the aboveground tree biomass rounds to less than 1 thousand dry tons. Columns and rows may not add to their totals due to rounding.

Table SD-54.—Area of forest land, in thousand acres, by inventory unit, river basin area, and forest-land status, South Dakota, 2010

Inventory unit and river basin area	Unreserved forests			Reserved forests			All forest land
	Timberland	Unproductive	Total	Productive	Unproductive	Total	
Eastern							
Belle Fourche-Grand-Moreau	28.3	5.7	34.0	--	--	--	34.0
Cheyenne	6.7	--	6.7	--	--	--	6.7
White-Niobrara	143.6	25.6	169.2	--	--	--	169.2
Bad-Missouri-Coteau-James	135.0	29.2	164.2	--	--	--	164.2
Minnesota-Big Sioux-Coteau	59.6	7.4	67.1	--	--	--	67.1
Total	373.2	68.0	441.2	--	--	--	441.2
Western							
Belle Fourche-Grand-Moreau	386.3	8.8	395.1	--	--	--	395.1
Cheyenne	949.4	11.5	960.9	30.2	--	30.2	991.1
White-Niobrara	55.6	--	55.6	--	--	--	55.6
Total	1,391.4	20.2	1,411.6	30.2	--	30.2	1,441.8
All counties	1,764.6	88.2	1,852.8	30.2	--	30.2	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-55.—Area of forest land, in thousand acres, by inventory unit, river basin area, ownership group, and forest-land status, South Dakota, 2010

Inventory unit and river basin area	Forest Service			Other Federal			State and local government			Undifferentiated private		
	Timber-land	Other forest land		Timber-land	Other forest land		Timber-land	Other forest land		Timber-land	Other forest land	All forest land
Eastern												
Belle Fourche-Grand-Moreau	--	--	--	--	--	--	--	--	--	28.3	5.7	34.0
Cheyenne	--	--	--	--	--	--	--	--	--	6.7	--	6.7
White-Niobrara	--	--	--	--	--	--	--	--	--	143.6	25.6	169.2
Bad-Missouri-Coteau-James	--	--	--	--	--	7.8	7.8	--	--	127.2	29.2	164.2
Minnesota-Big Sioux-Coteau	--	--	--	--	--	7.8	7.8	--	--	51.8	7.4	67.1
Total	--	--	--	--	--	15.6	15.6	--	--	357.6	68.0	441.2
Western												
Belle Fourche-Grand-Moreau	274.5	--	--	10.7	--	22.8	22.8	--	--	78.3	8.8	395.1
Cheyenne	717.7	25.5	--	4.1	16.1	41.1	41.1	--	--	186.5	--	991.1
White-Niobrara	--	--	--	--	--	--	--	--	--	55.6	--	55.6
Total	992.2	25.5	--	14.8	16.1	63.9	63.9	--	--	320.5	8.8	1,441.8
All counties	992.2	25.5	--	14.8	16.1	79.5	79.5	--	--	678.1	76.8	1,883.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Waiworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-56.—Area of forest land, in thousand acres, by inventory unit, river basin area, and forest-type group, South Dakota, 2010

Inventory unit and river basin area	Forest-type group												
	White-red-jack pine	Spruce-fir	Other E. softwoods	Pinyon-juniper	Ponderosa pine	Oak-pine	Oak-hickory	Elm-ash-cottonwood	Maple-beech-birch	Aspen-birch	Other hardwoods	Exotic hardwoods	Non-stocked
Eastern													
Belle Fourche-Grand-Moreau	--	--	--	--	--	--	5.7	25.3	--	--	--	3.0	--
Cheyenne	--	--	--	--	--	--	--	6.7	--	--	--	--	--
White-Niobrara	--	--	17.9	12.1	49.2	--	39.0	32.5	9.8	--	--	--	8.7
Bad-Missouri-Coteau-James	--	--	24.2	--	--	7.6	41.9	41.8	--	--	1.5	29.3	17.9
Minnesota-Big Sioux-Coteau	9.8	--	--	--	--	--	15.5	41.8	--	--	--	--	--
Total	9.8	--	42.2	12.1	49.2	7.6	102.1	148.2	9.8	--	1.5	32.2	26.6
Western													
Belle Fourche-Grand-Moreau	--	24.3	--	--	298.5	--	25.6	--	--	21.9	5.7	--	19.1
Cheyenne	--	32.9	--	38.4	750.1	--	8.6	8.1	--	43.3	17.4	--	92.2
White-Niobrara	--	--	--	3.0	33.8	--	1.4	7.0	--	--	10.4	--	--
Total	--	57.2	--	41.4	1,082.4	--	35.7	15.2	--	65.2	33.5	--	111.3
All counties	9.8	57.2	42.2	53.4	1,131.6	7.6	137.8	163.4	9.8	65.2	35.0	32.2	137.9

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties

Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties

Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties

Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties

White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-57.—Area of timberland, in thousand acres, by inventory unit, river basin area, and stand-size class, South Dakota, 2010

Inventory unit and river basin area	Stand-size class				All size classes
	Large diameter	Medium diameter	Small diameter	Chaparral	
Eastern					
Belle Fourche-Grand-Moreau	19.6	3.0	5.7	--	--
Cheyenne	6.7	--	--	--	6.7
White-Niobrara	106.7	6.9	22.8	--	7.2
Bad-Missouri-Coteau-James	55.1	50.6	11.4	--	17.9
Minnesota-Big Sioux-Coteau	42.4	15.7	1.5	--	--
Total	230.5	76.2	41.4	--	25.1
Western					
Belle Fourche-Grand-Moreau	270.4	46.1	56.6	--	13.2
Cheyenne	612.7	107.8	142.5	--	86.4
White-Niobrara	33.6	5.9	16.1	--	--
Total	916.7	159.9	215.2	--	99.6
All counties	1,147.2	236.1	256.6	--	124.7
					1,764.6

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-58.—Area of timberland, in thousand acres, by inventory unit, river basin area, and stocking class, South Dakota, 2010

Inventory unit and river basin area	Stocking class of growing-stock trees				Over- stocked	All classes
	Nonstocked	Poorly stocked	Moderately stocked	Fully stocked		
Eastern						
Belle Fourche-Grand-Moreau	10.6	7.6	10.2	--	--	28.3
Cheyenne	1.5	--	5.2	--	--	6.7
White-Niobrara	25.3	101.4	15.2	1.7	--	143.6
Bad-Missouri-Coteau-James	59.2	39.8	33.1	2.9	--	135.0
Minnesota-Big Sioux-Coteau	11.7	32.7	12.3	1.5	1.5	59.6
Total	108.2	181.5	75.9	6.1	1.5	373.2
Western						
Belle Fourche-Grand-Moreau	19.9	139.9	174.7	50.3	1.5	386.3
Cheyenne	153.0	484.9	256.1	55.4	--	949.4
White-Niobrara	17.5	29.6	7.1	1.4	--	55.6
Total	190.4	654.4	438.0	107.1	1.5	1,391.4
All counties	298.6	835.9	513.9	113.2	3.0	1,764.6

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the acres round to less than 0.1 thousand acres. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-59.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock					Sawtimber				
	Major species group					Major species group				
	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species
(In million cubic feet)										
(In million board feet)										
Eastern										
Belle Fourche-Grand-Moreau	--	--	12.9	2.7	15.7	--	--	61.0	9.8	70.8
Cheyenne	--	--	6.6	--	6.6	--	--	26.3	--	26.3
White-Niobrara	43.5	4.5	21.0	10.0	79.0	169.0	19.4	74.4	21.8	284.6
Bad-Missouri-Coteau-James	--	4.8	36.8	12.8	54.3	--	11.4	142.2	21.8	175.3
Minnesota-Big Sioux-Coteau	4.7	0.1	24.4	14.4	43.6	1.5	--	104.5	55.5	161.4
Total	48.2	9.4	101.7	39.9	199.2	170.5	30.8	408.3	108.8	718.4
Western										
Belle Fourche-Grand-Moreau	535.1	37.2	8.1	7.0	587.4	2,171.0	122.0	2.2	8.7	2,303.9
Cheyenne	1,029.7	36.5	6.2	7.1	1,079.5	3,632.0	127.9	2.1	28.6	3,790.6
White-Niobrara	23.5	--	0.5	2.4	26.5	77.5	--	--	10.5	88.0
Total	1,588.3	73.7	14.8	16.5	1,693.3	5,880.5	249.9	4.3	47.8	6,182.5
All counties	1,636.5	83.1	116.4	56.4	1,892.5	6,051.0	280.7	412.7	156.6	6,900.9

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties

Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties

Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties

Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties

White-Niobrara = Bennett, Jackson, Mellefte, Shannon, Todd, and Tripp counties

Table SD-59a.—Net volume of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (Scribner rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock					Sawtimber				
	Major species group					Major species group				
	Pine	softwoods	hardwoods	Soft	Hard	Pine	softwoods	hardwoods	Soft	Hard
(In million cubic feet)										
(In million board feet)										
Eastern										
Belle Fourche-Grand-Moreau	--	--	12.9	2.7	15.7	--	--	56.7	8.7	65.4
Cheyenne	--	--	6.6	--	6.6	--	--	23.7	--	23.7
White-Niobrara	43.5	4.5	21.0	10.0	79.0	149.8	15.7	32.8	18.4	216.7
Bad-Missouri-Coteau-James	--	4.8	36.8	12.8	54.3	--	9.2	131.4	18.3	158.8
Minnesota-Big Sioux-Coteau	4.7	0.1	24.4	14.4	43.6	1.2	--	94.4	49.1	144.7
Total	48.2	9.4	101.7	39.9	199.2	151.0	24.9	339.0	94.4	609.4
Western										
Belle Fourche-Grand-Moreau	535.1	37.2	8.1	7.0	587.4	1,889.2	104.1	1.9	7.4	2,002.5
Cheyenne	1,029.7	36.5	6.2	7.1	1,079.5	3,126.0	109.1	1.7	25.0	3,261.9
White-Niobrara	23.5	--	0.5	2.4	26.5	66.3	--	--	9.1	75.4
Total	1,588.3	73.7	14.8	16.5	1,693.3	5,081.4	213.2	3.6	41.6	5,339.7
All counties	1,636.5	83.1	116.4	56.4	1,892.5	5,232.4	238.1	342.7	136.0	5,949.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-60.—Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock					Sawtimber				
	Major species group					Major species group				
	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species
(In million cubic feet)										
(In million board feet)										
Eastern										
Belle Fourche-Grand-Moreau	--	--	1.2	0.2	1.4	--	--	6.0	0.4	6.5
Cheyenne	--	--	0.2	--	0.2	--	--	0.7	--	0.7
White-Niobrara	1.4	0.1	2.2	0.2	4.0	6.8	0.7	7.1	-1.9	12.7
Bad-Missouri-Coteau-James	--	0.4	0.4	0.2	1.0	--	0.4	3.5	0.9	4.8
Minnesota-Big Sioux-Coteau	0.9	0.0	0.7	1.0	2.6	0.3	--	1.7	4.4	6.3
Total	2.3	0.5	4.6	1.7	9.0	7.1	1.1	18.9	3.8	30.9
Western										
Belle Fourche-Grand-Moreau	8.0	0.7	-0.6	0.2	8.3	54.7	2.1	0.0	0.2	57.0
Cheyenne	21.2	0.6	-0.4	0.2	21.6	105.1	2.3	0.0	1.4	108.9
White-Niobrara	-0.7	--	0.0	0.0	-0.7	-3.6	--	--	--	-3.6
Total	28.5	1.3	-1.0	0.4	29.2	156.2	4.4	0.1	1.6	162.3
All counties	30.8	1.8	3.5	2.0	38.2	163.3	5.5	19.0	5.4	193.2

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-60a.—Average annual net growth of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber, in million board feet (Scribner rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock						Sawtimber					
	Major species group						Major species group					
	Pine	softwoods	hardwoods	Soft	Hard	All Species	Pine	softwoods	hardwoods	Soft	Hard	
												(In million cubic feet)
Eastern												
Belle Fourche-Grand-Moreau	--	--	--	1.2	0.2	1.4	--	--	--	6.8	0.2	6.9
Cheyenne	--	--	--	0.2	--	0.2	--	--	--	0.5	--	0.5
White-Niobrara	1.4	0.1	2.2	0.2	0.2	4.0	4.9	0.3	-0.4	-1.6	-1.6	3.3
Bad-Missouri-Coteau-James	--	0.4	0.4	0.2	0.2	1.0	--	0.2	2.3	0.4	0.4	2.9
Minnesota-Big Sioux-Coteau	0.9	0.0	0.7	1.0	1.0	2.6	0.1	--	0.8	2.2	2.2	3.0
Total	2.3	0.5	4.6	1.7	1.7	9.0	5.0	0.5	9.9	1.1	1.1	16.6
Western												
Belle Fourche-Grand-Moreau	8.0	0.7	-0.6	0.2	0.2	8.3	38.4	0.9	0.0	0.1	0.1	39.4
Cheyenne	21.2	0.6	-0.4	0.2	0.2	21.6	66.5	1.7	0.0	0.7	0.7	68.9
White-Niobrara	-0.7	--	0.0	0.0	0.0	-0.7	-1.9	--	--	--	--	-1.9
Total	28.5	1.3	-1.0	0.4	0.4	29.2	103.1	2.6	0.0	0.8	0.8	106.4
All counties	30.8	1.8	3.5	2.0	2.0	38.2	108.1	3.0	10.0	1.9	1.9	123.0

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-61.—Average annual removals of growing-stock trees (at least 5 inches d.b.h.), in million cubic feet, and sawtimber trees, in million board feet (International ¼-inch rule), on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock					Sawtimber				
	Major species group					Major species group				
	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species	Pine	Other softwoods	Soft hardwoods	Hard hardwoods	All species
(In million cubic feet)										
Eastern										
White-Niobrara	--	--	0.1	0.1	0.2	--	--	--	0.4	0.4
Bad-Missouri-Coteau-James	--	0.3	--	--	0.3	--	--	--	--	1.3
Total	--	0.3	0.1	0.1	0.5	--	--	--	0.4	1.7
Western										
Belle Fourche-Grand-Moreau	7.6	0.4	--	--	8.0	30.7	1.7	--	--	32.5
Cheyenne	15.5	1.3	0.0	--	16.8	45.7	4.8	--	--	50.5
White-Niobrara	--	--	--	0.1	0.1	--	--	--	--	--
Total	23.1	1.7	0.0	0.1	24.9	76.4	6.5	--	--	82.9
All counties	23.1	2.0	0.1	0.2	25.5	76.4	7.8	--	0.4	84.6

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties

Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties

Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties

Minnesota-Big-sioux-Coteau = Brookings, Clark, Clay, Codington, Day, Deuel, Grant, Hamlin, Kingsbury, Lake, Lincoln, McCook, Marshall, Minnehaha, Moody, Roberts, Turner, and Union counties

White-Niobrara = Bennett, Jackson, Melleite, Shannon, Todd, and Tripp counties

Table SD-61a.—Average annual removals of growing-stock trees (at least 5 inches d.b.h.) in million board feet, and sawtimber trees, in million board feet (Scribner rule) on timberland by inventory unit, river basin area, and major species group, South Dakota, 2010

Inventory unit and river basin area	Growing stock					Sawtimber						
	Major species group					Major species group						
	Pine	softwoods	hardwoods	Soft	Hard	Pine	softwoods	hardwoods	Soft	Hard	All Species	
												(In million cubic feet)
Eastern												
White-Niobrara	--	--	0.1	0.1	0.2	--	--	--	--	0.4	0.4	0.4
Bad-Missouri-Coteau-James	--	0.3	--	--	0.3	--	1.1	--	--	--	1.1	1.1
Total	--	0.3	0.1	0.1	0.5	--	1.1	--	--	0.4	1.4	1.4
Western												
Belle Fourche-Grand-Moreau	7.6	34.0	--	--	8.0	26.4	1.5	--	--	--	27.9	27.9
Cheyenne	15.5	1.3	0.0	--	16.8	38.6	4.1	--	--	--	42.7	42.7
White-Niobrara	--	--	--	0.1	--	--	--	--	--	--	--	--
Total	23.1	1.7	0.0	0.1	24.9	65.0	5.6	--	--	--	70.6	70.6
All counties	23.1	2.0	0.1	0.2	25.5	65.0	6.7	--	--	0.4	72.1	72.1

All table cells without observations in the inventory sample are indicated by --. Table value of 0.0 indicates the volume rounds to less than 0.1 million cubic or board feet. Columns and rows may not add to their totals due to rounding.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties
 Belle Fourche-Grand-Moreau = Butte, Corson, Dewey, Harding, Lawrence, and Perkins counties
 Cheyenne = Custer, Fall River, Haakon, Meade, Pennington, and Ziebach counties
 White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Table SD-65.—Sampling errors, in percent, for net volume, average annual net growth, average annual removals, and average annual mortality on timberland, and forest and timberland area by inventory unit and river basin area, South Dakota, 2010

Inventory unit and river basin area	Forest area	Timberland area	Growing stock				Sawtimber			
			Volume	Average annual net growth	Average annual removals	Average annual mortality	Volume	Average annual net growth	Average annual removals	Average annual mortality
Eastern										
Belle Fourche-Grand-Moreau	37.84	42.23	59.11	100.00	--	88.70	62.68	100.00	--	88.70
Cheyenne	86.45	86.45	100.00	100.00	--	--	100.00	100.00	--	--
White-Niobrara	16.53	18.02	22.05	58.19	63.96	65.02	23.81	76.20	92.25	66.95
Bad-Missouri-Coteau-James	16.32	17.82	29.56	36.86	80.96	39.29	37.86	33.07	88.70	66.44
Minnesota-Big Sioux-Coteau	24.43	25.48	55.93	47.32	--	--	68.88	87.01	--	--
Total	8.58	9.41	17.11	35.27	55.13	40.33	21.09	46.25	70.45	53.96
Western										
Belle Fourche-Grand-Moreau	10.51	10.61	13.60	45.20	39.24	51.13	15.19	23.34	40.37	44.34
Cheyenne	4.91	5.18	8.03	32.24	28.92	21.46	9.54	27.69	35.73	25.64
White-Niobrara	28.18	28.18	39.97	100.00	100.00	71.66	40.23	100.00	--	71.90
Total	2.67	2.87	5.13	27.23	22.53	20.48	6.62	19.67	26.09	20.88
All counties	2.87	3.01	4.91	23.14	22.16	18.65	6.32	18.25	25.69	19.49

Sampling errors that exceed 100% are reported as 100%.

Bad-Missouri-Coteau-James = Aurora, Beadle, Bon Homme, Brown, Brule, Buffalo, Campbell, Charles Mix, Davison, Douglas, Edmunds, Faulk, Gregory, Hand, Hanson, Hughes, Hutchinson, Hyde, Jerauld, Jones, Lyman, McPherson, Miner, Potter, Sanborn, Spink, Stanley, Sully, Walworth, and Yankton counties

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White-Niobrara = Bennett, Jackson, Mellette, Shannon, Todd, and Tripp counties

Appendix A. Tree Species in South Dakota (2010)

Tree species measured on field plots in South Dakota's 2010 inventory.

Common Name	Species
Boxelder	<i>Acer negundo</i>
Silver maple	<i>Acer saccharinum</i>
Paper birch	<i>Betula papyrifera</i>
Hackberry	<i>Celtis occidentalis</i>
Russian-olive	<i>Elaeagnus angustifolia</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Honeylocust	<i>Gleditsia triacanthos</i>
Black walnut	<i>Juglans nigra</i>
Rocky Mountain juniper	<i>Juniperus scopulorum</i>
Eastern redcedar	<i>Juniperus virginiana</i>
Prairie crab apple	<i>Malus ioensis</i>
Red mulberry	<i>Morus rubra</i>
Eastern hophornbeam	<i>Ostrya virginiana</i>
White spruce	<i>Picea glauca</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Red pine	<i>Pinus resinosa</i>
Eastern cottonwood	<i>Populus deltoides</i>
Plains cottonwood	<i>Populus deltoides</i> ssp. <i>monilifera</i>
Quaking aspen	<i>Populus tremuloides</i>
Chokecherry	<i>Prunus virginiana</i>
Bur oak	<i>Quercus macrocarpa</i>
White willow	<i>Salix alba</i>
Willow spp.	<i>Salix</i> spp.
American basswood	<i>Tilia americana</i>
American elm	<i>Ulmus americana</i>
Siberian elm	<i>Ulmus pumila</i>
Slippery elm	<i>Ulmus rubra</i>



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